AN INVESTIGATION OF ISSUES SURROUNDING THE DISCLOSURE OF ENERGY USE DATA ON MAJOR HOME APPLIANCES

By

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Abstract of Thesis Presented to the Graduate Council of the University of Florida in Partial Fulfillment of the Requirements for the Degree of Doctor of Philosophy

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The purpose of this dissertation is to examine the consumer information processing issues within the framework of formal programs designed to disclose standardized energy consumption data on labels attached to major home appliances. The research incorporated both the activities and the intent of the program to provide energy use data as the focus of the research decisions.

Essentially, the problem of interest is the impact of the information on behaviors characteristic of consumers' evaluation of major home appliances. The investigation was a controlled experimental setting within which subjects encountered information on refrigerator-freezers. The product class of refrigerator-freezers is an interesting one from the program standpoint. Refrigerators account for a large portion of household energy use due primarily to the fact that the product is continually in use. However, within the product class the energy consumption varies in response to the large number of model features which are available.

In order that the results be significant inputs into the policy decision the sample was actual consumers, housewives, who were paid for their participation. The sample was drawn with the intent of providing a reasonable cross section of the more general population in terms of income, education, etc. The subjects were recruited from local women's organizations in Gainesville, Florida.

The subjects encountered realistic product information on four models of refrigerator-freezer along the attributes of size, style, purchase price, frost free, icemaker, insulation, and energy use. The information on energy use was presented in such a way that certain research questions could be investigated. The first question is whether the energy use information will assist the consumer in behaviors related to major home appliances? The second question of interest is whether the format which is currently required by the Energy Policy and Conservation Act is the best way to disclose energy use data? These research questions required six treatment conditions. Five of the conditions were disclosure conditions which varied the format of the energy use data on the following dimensions; the unit of measurement by which to disclose energy consumption, the presence of comparative energy consumption, the time period used to compute energy consumption, and the degree of disclosure. These five disclosure conditions represent realistic alternatives for the format of the energy use labels. The sixth condition is a comparison condition which represented the present information environment without energy consumption data available.

These energy consumption treatments represented the only difference across the conditions, and subjects were randomly assigned to one of these conditions.

The experimental session was characterized by a complete profile of information impact through multiple dependent responses over a series of realistic product evaluation tasks and a product building decision.

The findings of the research support the potential of energy use data to impact on consumer purchase related behavior in a manner consistent with the overriding goal of the energy labeling program, the reduction of demand for energy.

_____

Chairman

CHAPTER I
INTRODUCTION

An issue of continuing concern in the public policy arena is the ability of the consumer to make informed purchase decisions. Often this ability is linked to the quality of the information which is available and used by the consumer. The assumed relationship between consumer information use and consumer decisions has been manifested in programs which have specified the provision of standardized product performance information. While the form and content of the different programs has varied (e.g., nutritional labeling, cigarette health warnings, gasoline octane ratings, etc.) the orientation to the information provision has been similar. Each of these programs have addressed a broad problem which is possibly remedied by the availability of information that had previously been unavailable, or available in less than optimal form. Ultimately, by providing the product information, the consumer decisions should be improved.

The Problem

This dissertation has come about through a concern for a broad societal problem, and the consumer information processing issues which characterize a program directed toward the problem. The problem is the broad area of energy use and the attendant limitations on fuel sources.

The phrase "energy crisis" has become a household word in the United States in recent years. The energy crisis calls to mind a whole spectrum of issues ranging from the verity of the problem itself

and the immediacy of the response to the myriad of formal and informal programs which stem from the problem. The consumers of energy have been requested to slow down, urged to buy smaller energy saving cars, encouraged to closely monitor housing temperatures and in general to become aware of energy consumption. In many of these cases, the behavior change has come about through a reaction to emergency energy situations. Severe winters, oil embargoes, and the lack of necessary contingency plans required a severe reaction in energy consumption. This reaction is particularly strong in the U.S. due to its immense demands for energy. With only six percent of the world's production, the U.S. consumes one-third of the energy and mineral resources produced worldwide each year ("What's Behind the Energy Crisis,"1975).

The problem of an energy shortage is essentially one of energy limitations. The limitations of existing fuel sources will dictate an eventual shift to other, as yet untapped, sources of energy (e.g., solar energy, wind energy, nuclear energy, etc.) However, all of the alternative power sources will not make substantial contributions to the fuel needs for some time to come. Thus, the emergency reactive measures will not overcome the energy shortage problem. What is needed is a more permanent and fundamental change in energy use patterns.

The Energy Policy and Conservation Act (EPCA)

The EPCA is the most recent in a stream of energy programs. The act, passed in December, 1975, is a very comprehensive energy program. The various provisions of the act stipulate the powers of the President,

provide for the establishment of energy reserves, urges the further development of existing sources of energy while attempting to reduce the general demand for energy. Among the program activities directed to the general goal of reducing the demand for energy is a mandated labeling requirement for major home appliances.

The labels are to contain energy consumption in annual dollars and a range of annual energy use for similar products. The labeling requirement is the responsibility of the Federal Trade Commission. However, the overall responsibility of the act rests with the Federal Energy Administration.

Research Issues

This dissertation has investigated two fundamental questions about the impact of the energy information on appliance labels. The crucial focus for this research is not whether the program will be a success (i.e., reduce the energy demand), but to address certain issues surrounding the character of the information. In essence the issues relate to the ability of the information to assist consumer decisions.

The concern of this investigation was to develop a clear profile of the impact of the disclosure issues. The disclosure of energy consumption data can be broken down into different dimensions which could relate to impact.

Unit of Measurement

The required disclosure is to be in annual dollars. The unit of measurement question (in the case of the EPCA, the unit of measurement is dollars) could have an impact on the disclosures. Generally, the

unit of measurement should uniformly communicate consumption. However, this issue must be viewed in light of the program goals, reduction in the demand for energy. If dollars are to be used as the unit of measurement, the consumption will be computed by a standard rate per kilowatt hour (KWH) of energy use. This will provide uniform energy consumption on each product across the country. Thus, while the relative energy consumption (on a product-by-product basis) would be constant, the consumer would not be able to ascertain the exact amount of energy use he would encounter with product purchase. It may be that the disclosure of the actual energy used (e.g., KWH) would be more in line with the goal of reducing the demand for energy. The question is whether there exist some incremental benefit (in terms of the consumer's use of the disclosure) of the dollar unit of measurement.

Time Period for Energy Use Computation

A second aspect of the disclosure is the time period chosen for computation of energy consumption. The mandate is for the energy use in annual terms. The time period for energy use computation is directly related to the magnitude of the disclosure. This is often an overlooked issue in program development but an issue which is put forth as an after-the-fact rationale of a program evaluation (e.g., with the unit pricing program). The issue is whether the larger time periods for reporting, monthly vs. yearly vs. total product life, provide benefits in impact by magnifying the relative differences between products and providing disclosures of greater magnitude. This is an interesting question in the area of energy use due to the fact the consumer typically encounters the energy use in monthly terms.

Comparative Disclosure

An important issue for the energy use disclosures is the impact of a new dimension of product information, relative energy consumption. This is the range of annual energy use for similar products. This aspect of the disclosure format should provide the basis for comparative performance judgments with regard to the energy consumption of a particular product. This judgment should be facilitated without the normal shopping behavior typical of the process to compare products. A set of scales specifically designed for this study will be used to investigate this important dimension of the disclosure format.

Degree of Disclosure

A crucial aspect of the disclosure of energy use is the ability of the consumer to identify those attributes of the product which account for energy use. At present, the disclosure would require a very careful trade-off procedure by product for the consumer to dissect the overall product's energy use into the sources (i.e., size, features, etc.). Given the complexity of the major home appliances, this would present a formidable task.

Of interest is the benefit of disclosing the sources of product energy use explicitly. This would not require the mental effort and would be expected to provide a more consistent reduction in energy demand. This issue is actually a step beyond the required disclosure but is consistent with the intent of the act.

Impact of the Disclosure

In order to carefully investigate the disclosure issues, it is necessary to discern the nature of the disclosure itself. The impact of the disclosure will provide a frame of reference through which to judge the impact of the form of the information. Thus, a group, representing the present information environment, will serve as a comparison point for this investigation.

The Central Research Questions

The issues discribed above served as a basis for the development of the conditions used to manipulate the energy use disclosure. There were five disclosure conditions and a comparison condition which provided insight into the research questions which were the focal point of the research:

1. Will the presence of energy consumption data on labels attached to major home appliances be likely to assist the consumer in purchase-related activities?

2. Is the reporting format required under the Energy Policy and Conservation Act the "best" way to disclose energy consumption?

The orientation of this research has been to develop the issues of the program from within the program activities. Also, the assessment of these issues is contingent upon the method of investigation.

The Method

This research was a controlled experiment investigating the impact of the energy consumption data. A sample of housewives were paid to participate in a study requiring evaluative judgments on a major home appliance, refrigerator-freezers.

The refrigerator-freezer is an interesting product in relation to the energy program. The product occupies a prominent role in the home. In addition, refrigerator-freezers account for a large proportion of energy consumption in the average household. This energy use is attributed to the fact the product is continually in use, rather than some unique product use characteristics. The variability in energy use for refrigerator-freezers is due to various features which make up the different models. Consequently, the refrigerators is a useful and relevant product class for the investigation of the energy use disclosures.

The Impact

The specifics of the data collection method reflects careful attention to the energy program. The program is in the early stages of development. Consequently, it is doubtful whether one level of impact would be able to completely address the issues under question. Further, researchers are generally urged to employ multiple measures of impact (Heeler and Ray, 1972, Wilkie, 1975, Day, 1976). The character of the results in total would provide better support for the research conclusions.

The use of multiple dependent measures characterizes this investigation. The fundamental issue is to provide a profile of the impact of information (in this case energy use information). It is felt that the impact must be measured as directly as possible rather than infering the information use from certain global responses. The levels of impact are essentially a hierarchy of responses to the product/information.

These levels represent initial evaluations, information recall, evaluations in the presence of the information, and a specifically designed choice situation. The key goal of these measures is to profile, as completely as possible, the impact of energy use information.

The Task

In order to obtain the measures, the task orientation of the subjects received considerable attention. The result was an involving experimental session which taps the levels of impact in a realistic fashion. The details of the experimental task will be provided later in the text.

Thus, the research effort is characterized by careful attention to the issues surrounding the disclosure of energy consumption data. The treatment conditions are potential candidates for the disclosure format, and can be compared across various levels of impact. These levels of impact, from initial model evaluation to attribute choice, provide a complete picture of the impact of the energy consumption information. The measures were taken from a sample of housewives, paid participants, responding to the product class of refrigerator-freezers.

The goal of the dissertation was to address the issues within the program to disclose energy consumption data on major home appliances. Each of the essential research decisions were made with this problem perspective as foundation, and results with implications to the energy program and the public policy research endeavors.

Organization of the Report

This dissertation is composed of six chapters. Following this introduction chapter, Chapter II presents the background material to the energy disclosures. Particular emphasis is given to three major activities; the M.I.T. report on consumer durables, the Voluntary Labeling Program, and the Energy Policy and Conservation Act. Past public policy research efforts and their limitations will be discussed along with the results of two focus group interviews, both of which serve as foundation for certain research decisions.

Chapter III is a formal statement of the hypothesis to be tested. Following the hypothesis is a presentation of the manipulations which serve as experimental conditions.

Chapter IV discusses the methodology employed in collecting the data. Within this chapter, the dependent measures, sample, experimental procedure, and experimental stimuli are discussed.

The results of the study discussed in order of the hypotheses are the substance of Chapter V.

Chapter VI is synthesis of the research with particular care to the issues of future research efforts.

CHAPTER II
BACKGROUND TO THE PROBLEM

Introduction

Within the past few years many activities have surfaced in response to what is commonly known as the energy crisis. The concern for dwindling resources for energy has resulted in many actions at both the local and national level. One of the centers of activity has dealt with the provision of energy information to the consuming public. The object of these provisions has been the demand for energy-related products. A recent set of activities has dealt with the provision of energy consumption information with regard to major home appliances.

This research effort is directed toward issues surrounding the successful implementation of a program to provide energy consumption information. In order to insure that research inputs will be useful for the program, the program activities must become the focal point of the research efforts.

This particular chapter will present the background material which has led to the research effort. The activities to be discussed are in three sections: 1) major energy programs or research; 2) focus group interviews; and 3) past research on public policy information programs.

Major Energy Programs and Research

The scope of this section is limited to the energy activities which one finds directly related to both energy consumption provision and the products which are classified as major household appliances. Thus, this chapter presents the major activities which led to this research project.

The M.I.T. Report (1972)

In response to a general concern, by a broad spectrum of society, with the costs and quality of product service, a major two-year study of the consumer appliance industry was undertaken. The study was conducted by the Massachusetts Institute of Technology's Center for Policy Alternatives, and the Charles Stack Draper Laboratory, Inc. under N.S.F.-RANN sponsorship. The purpose of the study was to examine alternatives to increasing the service of a product thereby reducing the cost of a product to the consumer.

To address this purpose, the study focused on the concept of life cycle costs. The definition of life cycle costs (LCC) is as follows:

> ". . . the sum of all dollars spent during a product's useful life." (MIT Report, 1972).

The concept of LCC centered on three cost components: 1) purchase cost - the price of acquisition; 2) energy cost - the price of power; and 3) service cost - the price of repair. These components represent the major portion of all dollars spent on a major appliance. The general implication of this approach is that it represents an extended view of the cost of a product. Given the ecological limitations on

energy, it is certainly reasonable to assume that energy consumption be viewed as a part of the cost of a product. The major contention of this report is that the public is not aware of cost (as it is viewed as LCC) of owning a major appliance.

Two points should be made before continuing. The orientation of this particular study is consistent with the thrust of the present concerns for energy conservation. As stated previously the MIT study focuses on the impact of LCC in terms of cost and quality of product service. The orientation is that the energy cost is a prominent component of LCC and that the quality inferences made about a product should reflect the changed conceptualization of costs. To carry this potential reasoning further, on another things equal basis, higher energy consumption would be interpreted as lower quality.

The second point is that the MIT study does not provide data as to either the present meaning of costs to the consumer, or to the possible impacts of the new view of costs. The MIT study investigated the state of the art of the appliance industry and provides credence to the new LCC concept as a valid and needed way of disclosing product cost.

In order to investigate the character of LCC in the appliance industry, two representative products were chosen for study: refrigerator-freezers and color television sets. By choosing these products, the project could investigate products which represented large LCC expenditures, and also products which demonstrated a different composition of the LCC. Purchases of color televisions and refrigerator-freezers accounted for $4 billion and $1.7 billion, respectively, in

1972. Further, refrigerator-freezers ranked first and color televisions ranked third in terms of annual expenditures on purchase, service, and energy when these costs were viewed collectively as LCC. Further, the study represents two different types of goods when viewed from a consumer good classification standpoint (brown - home electronics and white - major household appliances). Thus, when considering the product classes, refrigerator-freezers and color televisions, each product is representative of the broader major home appliance industry.

The results of the MIT investigation yielded some interesting findings with regard to the composition of LCC for refrigerator-freezers and color television.

Table 1

Summary of the Composition of Life Cycle Cost* for Refrigerator-Freezers and Color Televisions

LCC Components	Color Television	Refrigerator
Purchase Costs	53%	36%
Service Costs	35%	6%
Energy Costs	12%	58%
	100%	100%

*Source: The M.I.T. Report, "Consumer Appliances: The Real Costs."

It should be noted that the figures reported through the M.I.T. investigation were for years prior to 1971. Since that time the major economic problems would be reflected in changes in the composition of the life cycle costs. The national energy shortage has resulted in increasing energy costs coupled with strong inflationary pressures.

The costs of electricity rose thirty-six percent between 1973 and 1975, while the overall cost of living rose twenty-one percent ("What's Behind the Energy Crisis," 1975). These escalating costs accentuate the costs of products, particularly the magnitude of the energy component. The implication of the M.I.T. study remains, the inclusion of energy and service cost as a component of total costs changes the composition of the cost of an appliance dramatically.

Table 2 focuses more directly on the energy component of the LCC. Both refrigerator-freezers and color televisions occupy prominent roles in household energy consumption. Refrigerator-freezers alone account for 14.1 percent of the household energy expenditures. This finding provides some support for the attempts to provide energy consumption data. If the consumer, as assumed by the MIT report, is unaware of the LCC (particularly energy cost) it is possible that energy-related decisions may be affected by the disclosure.

One further note, from a technological standpoint there exists some potential for energy savings through improved design features on refrigerator-freezers. Thus, the disclosures, as the MIT report states, may facilitate these design changes through consumer expenditure shifts.

The MIT report highlighted the extent of energy consumption by major appliances and the apparent need for activities which lead to lower energy consumption. Two major activities have been oriented specifically to that purpose. The following sections will discuss the Voluntary Labeling Program and the Energy Policy and Conservation Act.

Table 2

Summary of Major Sources* of Residential Energy Use

Source	% of Total Energy Use
Refrigerator-Freezer	14.1%
Water Heaters	13.9
Lighting	13.4
Ranges	6.6
Clothes Dryers	6.0
Air Conditioners	5.2
Televisions	4.5
Space Heating	3.5
Other	32.7

*Source: The M.I.T. Report, "Consumer Appliances: The Real Costs."

The Voluntary Labeling Program

In December, 1973, the President of the United States, in an address on energy, directed the Department of Commerce to develop a voluntary program for energy efficiency (McGuire, et al., 1975). This directive became the first formal statement of the government's role of information provision in the energy consumption problem. As with many of the previous public policy programs, this action was in reaction to a broad problem, which is characterized by a lack of information available to the consumer. This program was to be carried out in cooperation with the Council on Environmental Quality and the Environmental Protection Agency.

The stated purpose of the program was to encourage manufacturers of household appliances to voluntarily provide consumers with information on the energy efficiency or energy consumption of products.

In addition to the mere provision of energy consumption data, the program hoped to encourage consumers to utilize the consumption data. The action with regard to this secondary purpose took the form of educating the consumers about energy consumption. The relevance of the voluntary program for this research project is related to the overall goal: the provision of energy consumption data. The energy consumption data was to be made available to the consumer through labels affixed to the product at the point of purchase.

In the past, research efforts related to public policy programs have been hampered by inexplicit or vague goals of the program. The voluntary labeling program rather uncharacteristically possessed explicit well-stated goals. The statement of goals is as follows:

> ". . . to encourage manufacturers to provide consumers at the point of sale with information on energy consumption and energy efficiency of household appliances. Such information presented in a manner readily understandable to consumers, would be attached to or otherwise provided with the appliance or equipment. The labels will include a system intended to make it possible for consumers to compare by cost or otherwise the energy consumption and energy efficiency when purchasing household appliances and equipment."

Thus, the program was designed to provide uniform, understandable information on energy consumption and efficiency so that consumers can use the energy consumption within the comparison process of a purchase decision. Note that the program goals refer to two dimensions of the disclosure: consumption and efficiency.

Energy Consumption vs. Comparative Energy Consumption

By attempting to communicate both consumption and efficiency, the voluntary program was going a step beyond past information programs. It is worthwhile to take a moment to discuss this change.

It is difficult to understand at first glance the difference in what is meant by consumption and efficiency. In fact, the issues become clear only after investigating the proposed disclosures under the program. The disclosure of energy consumption data represents the classic information provision, the disclosure of the particular product's performance along a specified dimension. With regard to the energy policy, the aggregate use of energy expressed in a specified unit per time period would be the disclosure of energy consumption (e.g., the energy consumption of model A is $60 per year). This disclosure provides the performance information, but, in and of itself, gives no clue to the relative performance of the particular product. It is to this issue that energy efficiency is directed. By communicating performance alone the consumer must make the comparative judgements through further search activity.

However, by communicating "efficiency" (comparative energy consumption), it provides comparative data. Thus, the term efficiency is misleading in that the disclosure is not addressing technical functional efficiency but rather the relative energy consumption (i.e., does model A appear to be more efficient than model B - consume less energy). The standard for efficiency then is the relative energy consumption of the product. The provision of comparative information is directed toward the comparison process of the consumer. In order

to make accurate comparative judgements, the consumer would have to engage in extensive shopping behavior. By way of example, the voluntary labeling program provides comparative energy consumption on air conditioners by presenting the range of energy efficiency ratios (energy consumption) of similar-sized air conditioners. The consumer, by this disclosure, can make the evaluative judgements of the air conditioners' energy consumption. This form of disclosure represents an empirical question which is, to date, untested.

Products Covered Under the Program

Under the voluntary labeling program, a labeling specification was to be developed for each of the following products:

- room air conditioners,
- refrigerators,
- refrigerator-freezers,
- water heaters,
- clothes washers and dryers,
- dishwashers,
- ranges and ovens, and
- central heating and air conditioning. (McGuire, et al., 1975)

The focal point for the development of these specifications was the Appliance Labeling Section of the National Bureau of Standards. The order of the products considered was determined according to estimates of potential energy savings. The program proceeded in a product by product fashion in all phases of development of a labeling specification in all phases in order to insure the information provided reflects the energy consumption character of the product class.

Summary of Program Activities

By February, 1975, the voluntary program had determined the unit of measurement by which to disclose the energy consumption on three product classes: room air conditioners, refrigerators, and water heaters. Table 3 shows the decisions with regard to the disclosure. These decisions were made with consideration to the unique characteristics of consumer use of the product, and/or consumer preference for a particular form of disclosure.

Table 3

Summary of the Disclosure Decisions by the Voluntary Labeling Program

Product Class	Date of Publication in Federal Register	Unit of Measurement
Room air conditioners	January 1974	energy efficiency ratio
Refrigerator	September 1974	dollars per month
Water Heaters	February 1975	dollars per year

The room air conditioner energy consumption was to be disclosed by an energy efficiency ratio (EER). The EER is obtained by dividing the cooling in British thermal units (Btu) per hour by the power requirement in watts. This particular disclosure was chosen due to the wide variation in product use and the critical nature of the size of the air conditioner units. For example, the energy consumption of a 2000 Btu room air conditioner would depend on the size of the room to be cooled, the temperature desired, the characteristics of the residents, etc. The unique features make the computation of an annual, or otherwise aggregated, cost figure impractical. The compara-

tive energy consumption was disclosed by a range of EERs for similar-sized room air conditioners. The unfamiliar nature of the EER resulted in an education program conducted by the Department of Commerce to explain the disclosure.

The next product class under consideration was refrigerator-freezers. This product class disclosure decision was characterized by a small scale survey of 100 residents in the Washington, D.C. area (Persensky, 1975). The survey investigated preferences for disclosure format by the sample. The results indicated a preference for the format of dollars per month. The rationale for this type of limited primary data collected as decision criteria rested with usage patterns of the product class. The patterns of use, and subsequent energy consumption, for refrigerator-freezers was uniform, and consequently did not require additional format consideration as with the air conditioners.

The final product class undertaken by the Voluntary Program was water heaters. The disclosure format chosen was dollars per year. Even though this product class is faced with certain unique usage characteristics it was felt that a standardized disclosure could convey the energy consumption data adequately.

The disclosure formats of both refrigerator-freezers and water heaters was characterized by energy consumption alone, and not the new dimension of relative energy consumption.

Response to the Program

While the voluntary labeling program was relatively short-lived, the response to the program was considered to be favorable. In the room air conditioner product class, the 24 manufacturers who participated in the program represented 95 percent of the sales of air conditioners in the United States. Of further interest, is the fact the average EER for all 115 volt window model air conditioners increased (improved) 6.5 percent from January, 1974 to January, 1975. This period coincides with the implementation of the labeling program for room air conditioners. There does not exist supportive data with regard to consumer response to the program for the same period. The recession, and the fact that very few labeled items were sold as inventories were slowly worked down, is the primary reason for the lack of documented consumer response. The improvement in the EERs is supportive of the potential impact of the disclosures. The activity relating to voluntary provision of energy consumption data has subsequently become mandatory under the Energy Policy and Conservation Act.

Energy Policy and Conservation Act (Public Law 94-163)

On December 22, 1975 the Congress of the United States passed into law what is commonly known as the Energy Policy and Conservation Act (EPCA). This act is the most recent in a stream of activity responsive to the issues related to the energy crisis. With rather broad scope, the EPCA is directed to the following overall goals:

> ". . . to increase the domestic energy supplies and availability, to restrain demand, to prepare for energy emergency, and for other purposes." (The EPCA, p. 871).

The act has far reaching issues and goals. The realm of consideration for this dissertation will focus on the aspect of the EPCA dealing with the provision of energy consumption on labels attached to major home appliances. The thrust of this area of the act is the consumer demand for energy related projects. Toward this end the EPCA specifies the following goal:

> ". . . to provide for improved energy efficiencies of motor vehicles and major appliances and certain other consumer appliances." (The EPCA, p. 874).

The particular action related to this goal is a labeling requirement on major home appliances.

Administration of the EPCA

The Federal Energy Administration has been designated the administrator of the act. However, the Federal Trade Commission has the most direct responsibility to determine the test procedures, while the Commission ascertains whether such disclosures are technically feasible and will 'assist' the consumer (The EPCA, p. 921).

Covered Products

At present the following products will come under the EPCA:

- refrigerators and refrigerator-freezers,
- freezers,
- dishwashers,
- clothes dryers and washers,
- water heaters,
- room air conditioners,

- home heating equipment,
- television sets,
- kitchen ranges and ovens,
- humidifiers,
- and central air conditioners. (The EPCA, p. 918).

The above list is composed of products with potential for energy savings. The criterion used for inclusion of a product was for the energy consumption of the product during normal usage to exceed 100 kilowatt hours per year (The EPCA, p. 918).

Labeling Requirement

At the present time the labeling requirement for the disclosure of energy consumption data specifies the following format:

(1) ". . . the estimated annual operating cost of such product," and

(2) ". . . information respecting the range of estimated operating cost for such type or class of products" (The EPCA, p. 922, paragraphs A & B).

Thus, the disclosure will consist of the annual energy costs and the range of estimated annual costs for that class of products. This mandate brings to the foreground some issues surrounding the disclosure.

First, the unit of measurement by which the energy consumption is to be disclosed is in dollars. The question surrounding this issue is the technical aspects of the disclosure standards and the clarity with which the disclosure is tied to the goals of the EPCA. The goals of the EPCA with regard to the labeling requirement are, unfortunately, not instructive: the criterion by which the labeling effectiveness is to be judged is that of the disclosurer's ability to "assist" the consumer in making purchase decisions (The EPCA, p. 922). There exists some criterion (i.e. assisting the consumer), but it is stated too broadly

to be directive with regards to research. As was discussed earlier, some products are characterized by unique usage aspects, which thwart certain kinds of disclosure (i.e. the EER for air conditioners under the voluntary program). Thus, as a contingency measure, the alternatives to the general disclosure requirements should be investigated. The first issue is that the present requirement must "assist" the consumer. This requires that the disclosure requirement be researched to attest to the superiority of annual dollars to assist the consumer. Even without the need to justify the disclosure impact, the technical nature of the disclosure standards suggest that contingency alternatives be investigated in the case of unforeseen disclosure problems.

The second issue stems from the disclosure of the range of comparative energy consumption for similar products. The act specifies that similar products are products the functions of which are similar. This tautology allows little guidance as to along what specific dimensions this similarity may be defined (i.e. size, features, style, etc.). As a matter of clarification this research will take the point of view that the criterion for the range of comparative energy consumption should consider those characteristics of a product which most closely relate to the variance in energy consumption. This formulation is consistent with the philosophy of the range disclosures. The range should allow a comparative judgment with regard to a product's energy consumption. Conceptually, this would be analagous to a consumer sampling an entire class of "similar" products with regard to energy.

When that consumer is confronted with a product's energy consumption that information can be evaluated against the other similar products by using the range of comparative values. Consequently, certain decision-related judgments should be facilitated by the range (e.g., the feasibility of shopping, evaluation of the performance, etc.).

The ability of the range to communicate this information is subject to the manner in which the range is developed. For the consumer the range should reflect the characteristics of the products which represent energy use. In this way the range would be formulated differently for different product classes (e.g., the air conditioners would have products similar in size, the refrigerator-freezer would have products similar in features, etc.).

It is important to realize that the operationalization of the range is crucial from a program point of view. In subsequent investigations the results of the comparative disclosure, either successful or unsuccessful, must be considered in light of the particular range under study.

With regard to the disclosure, it is encouraging to note the implied role of research in the decisions concerning the specific format requirements. The mandatory requirement must meet the criterion of aiding the consumer in purchase-related decisions. If this particular requirement does not meet this standard, the requirement is subject to change.

General Comments on Programs

The discussion has centered on three major activities which have served as primary background for this research project. These activities are not to be considered peripheral to the research, but are the focal point of this research effort. In some ways this is a unique thrust of academic/public policy research as the goal is to be responsive to the programs, rather than viewing the programs as only a vehicle for the research efforts. There are several ways in which research can be approached within the public policy arena. The program can serve as a framework from which to structure a research situation, or as a tool to can insight into consumer response in general. From this perspective the consumer issue becomes the focus, and only secondary input can be claimed to the public policy program. An opposite approach can be used. In this case the policy itself becomes the focus and the issues under investigation are attuned to program needs. For this purpose the research may draw upon a consumer behavior background to investigate program issues. The results would address the program from a consumer context. The latter is the approach taken in this dissertation.

Past Public Policy Research

While this research is focused on the issues surrounding the disclosure of energy consumption data, it is instructive to take a closer look at the broader policy environment to learn from past programs and research efforts. This type of effort is particularly useful when the focus of a research project is the policy action

rather than a broad theoretical framework. In the same manner as theoretically oriented efforts use the past research as foundation, the policy oriented efforts use past public policy research as support, and guidance.

This section presents the policy decisions and research efforts for past programs.

Public Policy Decisions

The problem of designing a consumer information program is a complex task. The exact flow of the policy decision has taken on different formulations (see Wilkie, 1975, Ferguson, 1972, and Day, 1974a). The essential steps include a problem identification stage (both product class and attribute decisions), the development of test standards, the determination of reporting formats and the means of disclosure, and the assessment of impact. Obviously, research efforts can input at any stage of the decision process.

With regard to the energy consumption program, many of the decisions must be taken as given by this dissertation. The relevant dimensions, product classes, and testing methods and standards are decisions which are not subject to change. However, research efforts can be useful inputs into the other decision areas. The formal activities in the energy consumption information programs have demonstrated both a need and desire for research inputs into the reporting format stage. The final format of the energy consumption disclosure within the EPCA, is subject to the confirmation of a particular format's ability to assist the consumer. In several academic position papers,

the lack of format-like research has been suggested as possible rationale for program effectiveness shortcomings (e.g., Monroe and LaPlaca, 1972 and Day, 1976).

The area of program effectiveness is an area where research efforts can serve policy needs. The need for evaluation of programs is crucial to future effort. Indeed, much of the research efforts has been toward this type of problem (i.e. does the program have an impact?). With the advent of more standardized requirements and more complex disclosures, the issues around program effectiveness types of research become difficult.

The issue of measurement have received attention in the literature. Day (1976), Wilkie (1975), and Heeler and Ray (1972), among others, have urged the adoption of multiple dependent measures. The basic issue is that a single level of impact does not allow for a complete and accurate profile of the impact of information. This is essentially an attempt to more carefully reflect the issues under study. In most public policy programs the standardized performance disclosure represents a new or changed input into the consuming public's information environment. The objective is to establish the impact of a particular disclosure. The essential question is what measure to employ. Since the phenomena under study is the information it would be instructive to tap those dimensions where information could or should impact. This would allow for the monitoring of impact across certain crucial dimensions; behavior, evaluations, cognition, etc., and a more careful assessment of a program. This

dissertation will follow this guidance and address multiple levels of information impact by incorporating multiple dependent measures.

The types of measures which are taken for program effectiveness are usually reflected in the task orientations of the research effort. As with much of the work in marketing a brand versus brand decision, orientation characterizes much of the policy directed research efforts. As Bettman (1975) states in an article on designing consumer information environments, instead of choice behavior, the impact of a given policy may best be reflected in accept/reject judgments. Wilkie (1976) suggests the use of more non-directive constructs which reflect knowledge with regard to information disclosures. The conclusion is not that behavior measures should not be implemented, but that behavior measures should be considered in the context of the broader impacts of a particular program. This impact will be measured by additional levels of effect and the use of task orientations other than choice, particularly brand choice, decisions.

Considering only the energy program for a moment, the program decision framework just presented allows for identification of areas of research potential. The energy program to date has been characterized by an inability to adopt specific uniform reporting formats and then by the EPCA mandatory format without consumer impact justification. The issues associated with the format of the disclosure represent important areas of needed research effort.

The general need to assess the effect of disclosures is faced with some rather complex problems. The ultimate goal of the program is to reduce energy-related demand. To assess the effectiveness of disclosures at this time is a difficult job. Energy information is a new informational input for consumers to use. If one were to apply a strict behavioral criterion to the disclosures, the success of the disclosure will be limited. It will be necessary to measure the levels of impact across different task orientations to better profile the success of the disclosures.

For the most part the recent research efforts have been characterized by attempts to assess the success of an information program. The early unit pricing studies, reported by Monroe and LaPlaca (1972), showed a desire to survey the state of awareness and use of unit pricing. However, the more recent studies by Houston (1972), Granger and Billison(1972), Isakson and Maurizi(1973), all attempted to measure program success. In the truth-in-lending area the study by Day and Brandt (1974), Stokes (1972), and Walker and Sauter, (1974) followed a program evaluation orientation.

There are few policy-oriented studies which are attempting to be inputs to other stages of the program decision. Russo, et al. (1975), Stokes (1973), and Chestnut (1976), in the unit pricing, nutritional labeling, and energy labeling areas respectively were oriented toward the reporting format stage. The crucial aspect is not what these studies found, but their orientation to their research. The orientation will limit to type of measures undertaken and the use of the results.

The stage of input to the policy decision is an important consideration when evaluating previous research efforts. However, a more crucial attribute, if one is to learn from these past efforts, is the quality of these efforts. This calls for a more critical look at the particular research efforts with an attempt to determine standards.

It would be outside the scope of this study to review all aspects of each of the research efforts undertaken for public policy purposes. However, there exist some crucial issues which reflect shortcomings in past research, which this particular study will try to overcome. The areas for consideration are experimental stimuli, sample composition, and the task orientation.

Experimental Stimuli

The products chosen for use as experimental stimuli have received very little critical attention. This decision represents a decision with regard to product class and brand names.

The choice of product classes represents an important aspect of the quality of the research input. In the unit pricing studies, one sees wide variance in the experiments attempting to assess the impact of information. Houston (1972), in a field experiment used 14 products, Gatewood and Perloff's (1972) lab experiment used nine products, Isakson and Maurizi (1973) used 13 products in a field experiment, Russo, et al. (1975) used three products, and Friedman (1966) used 20 products. The nutritional labeling program fared no better as Asam and Bucklin (1973), used one product (canned peas)

and Stokes (1972) used no products to determine the impact of nutritional information. Chestnut (1976), in the only energy labeling study, purports to test format alternatives by using the product class of light bulbs. With regard to the Chestnut study, the product class is not even under consideration within the energy labeling programs discussed in the earlier sections of the paper.

The disturbing aspect of the above studies and their choice of experimental stimuli is the virtual lack of overt criterion used in the selection process. The choice of experimental products should not be left to either convenience or subjective judgments. But, instead, the choice needs to be tied directly to the program goals. What is suggested is the establishment of overt criterion for product class selection. The suggested criterion are as follows:

- the relevance of the product class to the program,
- the variability of the product class along the dimensions to which the program is directed,
- the characteristics of product use,
- the prominence of the product in the household, and
- the state of knowledge of the consuming public.

When evaluated against these criterion measures, the product class choices of previous research appear to be lacking. For example, the impact of unit pricing would seem to vary by product class, and consequently the products used will have an impact on the conclusions to be reached. The only unit pricing study to use a criterion for product classes was the Russo et al. (1976) study, which implemented the criterion of variability between products or price. This criterion resulted in the use of dishwashing liquid, facial tissue, and dog food from which to make statements about unit pricing. In none of the

other studies on unit pricing is a criterion for product selection given. Also, the Chestnut study, a study which at first glance value would be relevant to the energy issue, is particularly lacking in the choice of product class, and the subsequent conclusion with regard to the policy should be suspect.

The second decision with the choice of experimental stimuli is the use of real vs. hypothetical brands. Brand names have been suggested and found empirically to impact on product choices (for example, see Bettman and Jacoby, 1975). Thus, if one were interested in the impact of information, the presence of brand may overwhelm or cloud the effects. If one could measure the effect of a brand name, the task of making unequivocal conclusions would be facilitated.

The researcher can opt for the use of hypothetical brand names. However, the study would be attacked for the lack of external validity. The situation the subjects are placed in is not "real." What can be attempted is the use of alternatives not tied to brand choice. In the area of energy consumption this can be accomplished by using model rather than brand choice. The consumer (subject) is then faced with a situation where the brand name is not known, but the task is reasonable when compared to typical shopping behavior.

Sample Considerations

There appears to be a shift into experimental work with regard to public policy programs. Consequently, the sample size is a function of the study objectives, and is not the crucial consideration. The important judgment is sample composition and the relation of the composition to the program. It is interesting to note that in only one

public policy research effect was the limits of sample composition related to the results. Day and Brandt (1974) reported the deficiencies of the sample which may limit conclusions about the truth-in-lending issue under study.

It is essential that the sample composition reflect the segments of the population which will be related to the success of a disclosure. Thus, consideration must be given to the decision making process related to the disclosure. As the disclosures become more and more complex, the selection of the sample must be made with care. The energy issue is a good case in point. The energy labels will be attached to major home appliances. The sample to be drawn must be related to the individuals making decisions about major appliances. It is expected that the sample composition would vary even between product classes. For example, the refrigerator-freezer decision may be characterized by a joint decision with the feature choice being made by the wife and with the technical aspects being decided by the husband. It is possible that the water heater decision will be made by the husband and dishwasher by the wife. These statements are not facts, but reflect the type of consideration that needs to be made by the researcher in determining the sample composition. The only energy-related study, Chestnut's (1976), is particularly lacking in this area. The use of 36 students to test the impact of alternative energy consumption formats render the results of the study of questionable usefulness to the energy program.

If policy research on information programs is characterized by deficient samples, the limitations of the sample should be stated so as to effectively delimit the corresponding results.

Task Orientation

The task orientation is a crucial decision for the experimental work done for public policy issues. This particular topic has been alluded to earlier. In most of the studies designed with information programs under consideration, the most frequent task orientation is choice, particularly brand choice. The task orientation would result in a limited view of impact since the only level of impact to be measured is behavior. It is possible that choice per se does not reflect the impact of information. As Bettman (1975) states, the brand choice decision may not be correct task to make a research input to a public policy program. It may be that the evaluations of a consumer better reflects the information impact in the more typical shopping experience. Also, this orientation would not place choice pressures on the individual in a one-shot experimental setting.

The designs which are used to test the impact of information must be attuned to policy needs. In order to provide a meaningful input, the task must be structured so as to reflect the interaction between consumers and information in a typical shopping situation. This requires that the tasks and task orientation be determined with regard to policy needs, and to the real life information/consumer interaction.

This section has attempted to provide a framework for public policy research. To do this a view of policy decisions followed by crucial issues concerned with policy research were presented. This discussion was oriented primarily to describing past research efforts.

The highlights of this review provide the following generalizations. Most of the studies have attempted to ascertain program effectiveness through the use of consumer surveys, focusing on the impact in terms of consumer choices. The investigation did not provide objective criterion for product class choices. The overall conclusion is that this manner of investigation did not allow for meaningful inputs to the policy program under question. This dissertation will address the questions of program impact through the format decision. Since the focus is on information this dissertation will attempt to provide a complete picture of effect by measuring impact at multiple levels. The task orientation will reflect these levels by providing orientations consistent with the phenomena under study. With this background the research of this study can overcome the past deficiencies, and provide a sound input to the energy consumption information program.

Focus Groups

Toward this end two group interviews were arranged through the Central Florida Research Group, a local professional organization. The groups were selected on the basis of education due to past policy oriented efforts (Day and Brandt, 1974) showing variance in response to information programs correlated with education. Group 2 was a low-education group, operationalized as a high school education or below. Group 1, selected on the basis of a college education, was the high-education group. As Table 4 shows, the groups did follow these guidelines. In addition, as a result of the education differences, the

Table 4

Demographic Profiles of Group Interview Participants

Characteristic	Group 1	Group 2
Age		
18-22	2	--
23-28	1	1
29-33	--	3
34-38	--	3
39-44	1	1
45 or above	4	--
Education		
11 or below	--	1
12 years	--	6
some college	1	1
college graduate	5	--
post-graduate	2	--
Income		
$ 0- 4,999	--	1
5- 9,999	1	3
10-14,999	2	2
15-19,999	2	2
20,000 or above	3	--
Marital Status		
married	8	6
divorced	--	2
Last Appliance Purchase		
1 year	2	4
1-3 years	5	1
4-6 years	1	2
7-9 years	--	--
10 or more	--	1

groups differed on the basis of income. Each group consisted of eight female residents of Gainesville, Florida, or nearby communities. None of the participants were connected with the university. The participants were paid $8 for a group interview session lasting approximately one hour. Group 1 was conducted by the author, and Group 2 was conducted by R. Bruce Hutton. In order to insure some uniformity between

the groups, the group leaders determined a standard introduction, and basic outline of the discussion. Permission was obtained from the participants, and each session was recorded.

At the beginning of each session, the group leader explained that this interview was conducted in conjunction with in-process dissertations on consumer decisions relating to major home appliances. The group was introduced to one another, and the group leader requested that each participant place herself in the role of a consumer. The participants were told that they were to think about the purchase of a refrigerator-freezer. The groups were told that this product was chosen to facilitate discussion, and because each of them had considerable experience with refrigerator-freezers. The participants were then told to think of things they consider when they are going to buy a refrigerator-freezer. The discussion proceeded in a voluntary fashion with effort by the group leader to encourage participation.

Tables 5 and 6 summarize the results of the two groups. Table 5 presents the order of discussion of the characteristics of refrigerator-freezers. Table 6 summarizes the comments made about the characteristics of refrigerator-freezers by group.

In general, some important differences between the groups emerged. The energy use dimension was brought up for discussion very early by the high-education group, but had to be suggested by the group leader in the low-education group. The high-education group discussed the energy use by features, and felt that the information

Table 5

Summary of Characteristics of Refrigerator-Freezer by Order of Discussion

Group 1 High Education	Group 2 Low Education
1. sources of information	1. frost free
2. frost free	2. icemaker
3. energy use	3. water dispenser
4. price, costs	4. vinyl door coverings
5. icemaker	5. shelves
6. shelves	6. color
7. vegetable bins	7. service
8. meat tray	8. maintenance agreement
9. size	9. warranty
10. location of freezer	10. shopping-around process
11. expected life	11. brand name
12. rollers	12. size
13. service*	13. expected life
14. maintenance agreement	14. costs*
15. warranty*	15. energy*
16. textured steel door	16. sources of information
17. color	
18. salesmen	
19. shopping-around process	

* characteristic suggested by group leader.

was presently available on the labels of the appliances. The low-education group's comments indicated a general concern for energy, but an aversion to information, since those commenting felt they would have difficulty "understanding" the information. The participants of Group 2 indicated that they would pay more for energy saving, but the saving would have to be automatic--those commenting did not want "a course on how to save energy."

The high-education group appeared to be oriented more to the use of information. The group expressed faith in such sources as Consumer Reports as a starting point, and said they would read the

Table 6

Summary of the Comments of Groups 1 and 2 Made About Characteristics of Refrigerators

Group 1	Group 2
1. FROST FREE	1. FROST FREE
It is the number one thing I would look for. Uses a lot of energy. Essential. Estimate of energy cost--1/3 more, $1 per month.	I don't like to defrost. The food doesn't spoil. Dries food out Didn't know they made any that weren't frost free.
2. ICEMAKER	2. ICEMAKER
Gimmick Tremendous luxury Saved my marriage That's an energy consumer, too. There's a problem with water and corrosion. Cost--$40 plus installation	Don't spill water anymore. My mother has one. Ice trays don't last, and they pinch my fingers. Can transfer extra ice. The arm keeps it from making more. Uses more electricity, but it's worth it. Doesn't make ice fast enough.
3. WATER DISPENSER	3. WATER DISPENSER
Not mentioned	I won't have the nozzle on the door Clogs up. It's not worth the trouble. Not a selling point, but the kids love it.
4. TEXTURED DOOR COVERINGS	4. VINYL DOOR COVERINGS
Doesn't show fingerprints. Most super-marvelous thing that has ever happened.	Doesn't show fingerprints. Saw a commercial that said you could change the colors.
5. SHELVES	5. SHELVES
Adjustable shelves are a necessity. Essential. I'd like wide shelves on the door. I'd look at the supports on the shelves.	Don't like plastic holders on the shelves Adjustable shelves, in case I want the shelves in different places. Wide spaces in the door for large objects.

Table 6 (continued)

6. COLOR	6. COLOR
Important Cost a little extra, but not much over the life.	I like colors. Makes a gayer kitchen. Doesn't show dirt as easy--depends on the color. Cost more--about $10. It used to be more, not it's got to be about the same.
7. SERVICE	7. SERVICE
I would consider that dependability Consumer Reports--calls per year. $15 to walk in the door.	So important where you buy it. Would pay a little more for my appliance to buy it from someone with a good service department. Live here long enough to find out. If the salesman is proud of it, he'll tell you. Cost-too much no matter where. Have to think of what you'll lose. $18 just to come out. Like doctors, they charge you so much then parts.
8. MAINTENANCE AGREEMENT	8. MAINTENANCE AGREEMENT
I don't personally think those service contracts are that beneficial. No good the first year. Good in the last years of life, but expensive. Dealers are not too reliable in upholding them. Lottery. Gamble.	If it breaks down the first year, it's already paid for. It's worth it the first year. It's like insurance. It gets higher the older the appliance. Usually there isn't anything go wrong the first year.
9. WARRANTY	9. WARRANTY
I think they are pretty standard. 5 years on the motor. It's different for the motor, and other things. It's always the part that isn't covered that breaks.	5 years--to me that's all you need. Things break down as the warranty runs out. Not a complete one (replacement) after the first year.

Table 6 (continued)

9. WARRANTY (continued)	9. WARRANTY (continued)
	They only pay so much. They use it in their sales. Rather they didn't charge me for that little goodie, and let me buy my maintenance agreement. Does warranty add to price? No, Goes with every product. That's why it's not worth anything.
10. SHOP-AROUND PROCESS	10. SHOP-AROUND PROCESS
Read in Consumer Reports, ask, then look within price constraints. Read label. Go to stores that sell a lot of brands. Husband decides the technical stuff. You need to be informed.	Shop around, get pamphlets and prices, and go to the next store. You have to shop. I don't want any paper--I have to look at the item. See if it will hold my groceries. Best price for what I want.
11. BRAND NAME	11. BRAND NAME
Not mentioned.	Reasonably important--don't think I'd buy Teddy Bear brand. I'd have to know the brand--something I'm familiar with. Yes, there are differences in quality--commercials made us think this. Pay for quality--depends on the situation. Wouldn't borrow money to get a better one.
12. SIZE	12. SIZE
Important Depends on the family size, and the space in it. 14 to 15 cubic feet is big. Mine holds 150 lbs. (freezer). What's the largest you can get--that's it.	I don't understand it (cubic feet)--have to see if it will hold my groceries. When they say 20 cubic feet, you don't get that much. Just some rigamorole they throw in. Size of the freezer is a big thing.

Table 6 (continued)

13. EXPECTED LIFE

15 years on the average.
The more money you pay the longer it lasts.
Look at the specifications on the label.

14. COSTS

Important.
$300 to $800.
The more money you pay the longer it lasts.
What makes them last--# of coils. Better engine.
Look at the specifications on the label.
Smart to compare on price--someone might be having a wingding of a sale.

15. ENERGY USE

I would be interested now in what kind of energy savings are available.
Supposed to be listed on a little fact sheet.
c/KWH.
Depends on how energy conscious you are.
I keep track of how many KWH we use.
We contradict ourselves, because I want that (frost free), but I know for a fact that it is one of the biggest consumers of energy.
Depends on whether you want to use that energy or your energy.
It's not exactly energy conscious-more cost conscious.
No real difference across brands.

13. EXPECTED LIFE

You keep it 15 years.
15 years for a Frigidaire.
Mine lasted 10 years.
Every brand varies.
Doesn't last as long anymore.

14. COSTS

$850 to $1,000
Around $300
$600 with an icemaker.
Icemaker--$89. Less than $100.
They charge you for hooking it up.

15. ENERGY USE

I have an energy saver; I don't understand it at all; it's a new little hickey; something about when the weather is damp you do something.
They give you a whole book on it--you know I never read the book and never mashed the little hickey.
Too many other things.
If it is automatic--ok--but I don't want to do anything.
Have to save a lot for me to mash the button.
Selling point.
Got to be something you plug in and is automatic--they are getting paid for it.
I don't want to waste energy.
Pay more for energy saving, but I won't read a book.

Table 6 (continued)

15. ENERGY USE (continued)	15. ENERGY USE (continued)
	Don't want a course on how to save energy. Couldn't understand the books anyway.
16. SOURCE OF INFORMATION	16. SOURCE OF INFORMATION
I would go to a consumer information outfit. Labels. Shop around. Ask the neighbors.	Just being involved. Experience. I watch commercials. Salesmen. Having used the product. Husbands handle the complex stuff.
17. VEGETABLE BIN	17. VEGETABLE BIN
I'd die without one.	Not mentioned.
18. MEAT TRAY	18. MEAT TRAY
Not mentioned.	Not mentioned.
19. LOCATION OF FREEZER	19. LOCATION OF FREEZER
Side-by-side is bad--I'd never have another one. Children get in. I think I get more in mine now--located on top. Top with separate door is best. Side-by-side is bad for big stuff.	Not mentioned.
20. ROLLERS	20. ROLLERS
Very important for cleaning.	Not mentioned.
21. SALESMEN	21. SALESMEN
You have to think for yourself. A lot of these people that sell in the stores aren't really aware of all the specifications. It's surprising how little they know.	Not mentioned.

labels. Both groups stated that considerable shopping occurred. The expression of abstract concepts such as size and quality appeared to be difficult for both groups, although the existence of the concepts appeared to be universally accepted.

Each group appeared to be price conscious, and stated that they looked for the "best deal."

Each group had a significant amount of experience with the product, and appeared to be familiar with the features available. However, the participants were chosen from one geographical area, and consisted of only white females. In order to insure that the results found are representative for other areas, additional groups in other geographical locations should be conducted. The purpose of the investigation was not to test hypotheses or to generate testable data. The groups allowed for greater knowledge of the consumer and the product class of refrigerator-freezers. Thus, the attributes deemed important and the terminology used when interacting with the product class were identified. This information serves a useful purpose in stimulus development, and construction of the test instrument. Further, the differences between the groups was instructive for this research due to the fact that the sample for this study will be taken from the population in Gainesville, Florida, and the surrounding area.

Given the background presented in the policy activities related to the provision of energy use information, past policy research, and the results of the group interviews, the discussion will now turn to the specific research issues to which this dissertation is directed.

CHAPTER III
HYPOTHESES AND MANIPULATIONS

The hypotheses around which this research was developed stem from the goal of identifying the relationship between certain independent variables which characterize energy consumption disclosure and certain levels of impact. The specific hypotheses are generated from the general working hypothesis that the disclosure of energy consumption data will have a positive impact (positive in light of the goals of the EPCA) on the purchase decisions of consumers of major home appliances. The following hypotheses will reflect the levels of impact and the relationship of impacts to the different disclosures.

The first hypothesis relates the impact of energy-use data on the evaluations of alternatives in a shopping experience.

Hypothesis One: Impacts of the Disclosure

> The disclosure of energy-use data will have a significant impact on the preferences, overall impressions, and energy-use expectations of alternative refrigerator-freezer models. Specifically, subjects receiving energy-use data will have lower preferences, lower overall impressions, and more accurate expectations of energy use for models which are high users of energy.

The first hypothesis is directed toward the impact of information in a situation where the consumer is evaluating alternative appliance models (i.e. models with different features). This is a very important question. In many cases the degree of shopping behavior with regard to

consumer durables is characterized by a lack of extensive store-to-store shopping (Olshavsky,1973, Newman and Staelin,1973). Given this characteristic of behavior the crucial product decision appears to revolve around model/feature combinations of particular appliances. The question then becomes what types of impact can be desired or expected with regard to energy consumption disclosures.

The energy information, if it is being used within a decision, should impact on product/model evaluations. This does not mean that the presentation of energy use data will make the energy dimension more important, but that the consumers' model evaluations should reflect the product's energy usage. If a model is a high energy user, a positive impact of this disclosure of energy use should be reflected in lower preferences and evaluations. This is not to say that the consumer should prefer a model that does not meet other requirements, but within the model/feature combinations under consideration the consumer preferences and evaluations will reflect the energy consumption data. For example, the energy consumption of a model of refrigerator-freezer that does not have a freezer section would be very low since the freezer section accounts for a large amount of energy use. However, a model without a freezer would most likely not be preferred, even with exceptionally low energy use. Essentially, this is saying that the energy use data should be handled in a realistic fashion within a decision context.

The attempt to measure evaluative judgments centers on a dimension that has not been represented in public policy research to date. Impact has not been operationalized at levels of impact and, consequently, the

impact of previous standardized disclosures on the product evaluations has typically not been tested.

The question of expectations addresses a more fundamental issue with regard to the disclosure of energy use. Do consumers, given the present state of knowledge, have accurate expectations of energy use with regard to appliances? A crucial assumption behind the disclosure is that aspects of the consumers' purchases will change when this information becomes available; thus, there is a need for the information. If consumers, however, accurately predict either the relative or absolute energy consumption of alternative model/feature combinations without the information, then the need for energy disclosures becomes less apparent. This hypothesis states that consumers will be unable to state accurately the energy consumption of a given model without the disclosure.

This consideration becomes more important the closer the models are in terms of features. The more substitutable the models, the more likely the difference in energy consumption will be useful in discriminating models. For example, the consumer would accurately be able to rank two very different models (i.e. a small refrigerator with manual defrost versus a large-size side-by-side with all the accessories). The crucial test is that as the models become more alike does the discrimination break down for those without the energy use disclosure? This is more characteristic of a shopping experience. The consumer is confronted with a set of objects differing in features, but generally satisfying a set of needs. The decision is to then select the model which is best from among the alternatives. It should be stated that

this hypothesis does not reflect different degrees of knowledge or education with regard to energy consumption, but is in fact related to the present consumer information environment as a potentially relevant consideration in related uniform information provision areas (i.e. unit pricing).

The second hypothesis deals with the impact of comparative information. The shift toward the disclosure of uniform product information is well documented. Recent actions with nutritional information, octane rating, miles per gallon, etc. have provided uniform product performance information. But, these disclosures are not really comparative. The performance information alone does not give an indication of the product's relative performance. This does not reflect one of the central goals of the disclosure. As a task force report submitted to the Federal Trade Commission states, the disclosure should be provided uniformly on all brands of a given product and in such manner as to be readily understood and capable of being easily compared by the average consumer (Ferguson, et al., 1972, p. 42). In light of this goal (i.e. comparison judgments) the recent energy consumption requirements specify a range of values of energy consumption for "similar" products to accompany the performance information. The second hypothesis tests the effect of this information.

Hypothesis Two: Testing the Provision of the Range

> The disclosure of relative range of energy consumption values for similar products will provide comparative data which will result in significantly different judgments with regard to the feasibility of additional shopping, the likelihood of finding a better value, and encouraging purchase. Specifically, for Model 2 (a model which is comparatively a high energy user), subjects receiving the range of energy consumption

> values will state that it is more likely that a better value could be found, that it would be worth the effort to engage in additional shopping, and would discourage with regard to purchase when compared to subjects who did not receive the range of values.

In developing this hypothesis it is necessary to conceptualize the impact of comparative information. The consumer is attempting to allocate income to the best combination of price and quality within certain brands or models. The result of the presentation of performance standards is to facilitate this judgment. Consequently, if an object is comparatively poor on the performance dimension associated with the disclosure, given that the dimension has meaning and is important to him, the judgments with regard to the price/quality relationship should be altered (lowered). Thus, energy use is implicitly assumed to be directly related to quality. Theoretically, this would result in the consumer looking to other similar objects from which to make a choice. Thus, the comparative information should impact on the judgments of product value, shopping behavior, and purchase decisions of the consumer.

It should be stated that the disclosure of comparative information can be accomplished a number of different ways, and the manner of disclosure could affect the impact. Consequently, the operationalization of this dimension is a crucial consideration with regard to this hypothesis.

The third hypothesis reflects the need for accurate perceptions of the energy consumption of alternative models or products when confronted with the information. The hypothesis is:

Hypothesis Three: Evaluation While Disclosure is Present as an Aid to Processing

> The disclosure of energy consumption data will result in accurate perceptions of a product's energy use when subjects are not required to rely on memory for this judgment. Subjects will perceive the products with high energy use as less good than those products with low energy use.

This question addresses the disclosures from the ability of consumers to accurately perceive a product along the dimension of energy consumption. What the consumer must be able to accomplish is an accurate evaluation of the product's energy use. This addresses a more central impact, which in truth must be present before the more interesting behavioral measures can be found. The dependent measures in this hypothesis provide important diagnostic powers with regard to the eventual impact of the energy consumption in choice situations. This test differs from the previous two hypotheses in that the crucial comparison is not between treatments but between products. The consideration is for the consumer to be "able" to correctly perceive the product's energy consumption. If a model uses a large amount of energy, the subjects' evaluative judgments should reflect this (i.e. be evaluated as poor with regard to energy).

The fourth hypothesis tests the impact of energy consumption with regard to choice behavior.

Hypothesis Four: Demand for Product Features

> The presentation of energy-use data will have a significant impact on the demand for energy-related features. The exact impact is that the disclosures will result in more energy conscious decisions with regard to product/feature decisions. This will be reflected in smaller size choices, less demand for

> frost-free defrost, higher demand for poured insulation and the power mizer, and less demand for icemakers.

This hypothesis addresses the final level of impact, the impact the disclosure of energy consumption has on behavior. Day (1976) regards this level of impact to be a crucial test of a public policy information program's success. However, the choice criterion has typically been looked upon as object/product/brand choice. By forcing this type of choice upon subjects, the researcher places an unreasonable burden on the disclosures. The choice of models or products relate to broad needs and motives regarding a purchase, and may not reflect the more subtle impacts of the disclosures.

The behavioral impact has been directed to choice of features each subject chooses to include on a personal model of refrigerator-freezer. This allows for the analysis of the impact with regard to energy-related as well as functional and convenience features. The basic assumption is that the disclosure of energy consumption will provide the consumer with information not only about what models use energy, but what features associated with the model seem to account for the energy consumption. It is possible that this disclosure is not explicit (i.e. frost-free uses X amount of energy) so that the consumption of a particular feature must be deduced. However, this is crucial. For the disclosure of energy consumption to have a positive effect, the demand for energy-using features must be affected. The subjects who receive the energy consumption data will be less likely to choose energy-related features. This relationship must, however,

consider the broad energy use benefit decision of a feature. Also, this method of gathering the choice dimension can also reflect a total energy choice of subjects. By summing the feature choices and the related energy use of these features, a respondent's model can be viewed from the total energy consumption of the model that the subjects choose.

The next hypothesis reflects the effectiveness of alternative disclosures with regard to the levels of impact.

Hypothesis Five: Importance of Disclosure Format

> The format of the disclosure of energy-use data will have a significant impact on the success of the program to disclose energy consumption. The disclosure formats will be evaluated with regard to preferences, evaluations, and product choice. Specifically, the disclosure of energy consumption in dollars will have a greater impact than the disclosure in kilowatt hours. The disclosure of energy consumption in yearly units will have a greater impact than the disclosure in monthly units. Also, the format disclosing energy use data by feature will provide additional benefits over a condition not providing feature-energy use data.

The first four hypotheses deal with the issue of the success of the program to disclose energy consumption. Thus, the crucial comparison becomes, does a group with energy consumption data perform differently than a group without energy consumption data available? The fifth hypothesis addresses the issue of the impact of alternate disclosure formats. There exists a number of different dimensions along which the disclosures can be varied. In light of the prescriptions of the energy act, the nature of the disclosures become crucial. Consumers will be faced with the information on labels attached to products.

Thus, the consumer must be able to use the information for evaluative and comparative purposes.

The levels of impact need to reflect the success of various disclosure alternatives. The consumer must be able to use the information for both evaluative and comparative purposes. The alternative disclosures will be evaluated in light of the different formats' effects on preferences, evaluation, and choice.

The impact of alternative formats has been suggested in the literature, but rarely tested well particularly in light of policy needs. This type of manipulation, to be meaningful, requires that the policy become the focus of the research. The format decision has been suggested by Day (1976) to be a crucial fundamental research decision. This research will investigate four dimensions of disclosure formats: the unit of measurement; the time period of the disclosure; the presence of feature energy use; and, the disclosure of comparative information.

The unit of measurement decision is particularly interesting with regard to energy disclosures. The disclosure can be in dollars of energy use or in terms of the actual energy use units (i.e. KWH, gasoline, etc.). The disclosure in terms of actual energy use units provides flexibility with regard to the consumer's ability to predict the actual "energy cost" which would result from a product. With the recent rate increase and the variations by season and geographical area, this particular consideration can be important. However, the dollars of energy use represent a familiar non-ambiguous disclosure which has some appeal. The familiarity of the respondents with the disclosure has been suggested as an important variable with regard to information impact (Day 1976).

The time period over which to report energy consumption has been suggested as a relevant consideration in related uniform disclosure programs. Monroe and LaPlaca (1972) have postulated that the impact of a disclosure will be greater for disclosures in larger units, due to the fact that the larger units will magnify the product differences along the relevant dimension. However, the disclosures of monthly values may relate to the consumer budget and bill-paying behavior so the magnitude of the disclosures becomes a relevant consideration.

An additional dimension under consideration would be the degree of disclosure. The impact of the program may ultimately rest with the consumer's ability to associate product energy use with the features that most account for the energy consumption. With the complexity of major home appliance this energy use/feature judgment may be difficult to make. This research will incorporate a disclosure format which explicitly discloses the feature contribution to energy use. This additional (by feature) disclosure is expected to provide additional benefits to the consumer.

Thus, the effects of the alternative disclosures should provide an input for future research, while being informative with regard to the strategical disclosure decisions.

Hypothesis Six: Who Will Benefit?

> The impact of the disclosure of energy consumption will be dependent upon the characteristics of the individuals receiving the energy consumption data. The disclosure of energy consumption will have a greater effect on high-education consumers when compared to low-education consumers.

The public policy efforts relating to information disclosures have been faced with a success story which is potentially paradoxical in nature. The goal of the programs has been to improve the purchasing habits of the consuming public. In the past certain efforts have been directed to problem areas such as nutrition and credit information. In both of these cases the information will do the most good for those members of the consuming public who are less informed. This informed characteristic has been linked to the dimensions of education and racial group. Day and Brandt (1976) found that the truth-in-lending information has the least success for low-education consumers and minority groups. This result suggests the success of the program may be tied to the groups which need relatively less help in the area of credit information practices. Although the nutritional area has not been researched and reported to the degree which would be necessary to make any conclusive statements, the potential for the same sort of result as in the truth-in-lending issue is possible. There are, according to the report which stimulated the nutritional labeling TRR, wide-spread deficiencies in the nutritional character of the population. However, certain segments suffer to a greater degree than others. The poor and low-educated consumers are the most deficient, but will probably gain the least from nutritional disclosures. This is not an empirical fact, but in the CRI study on formats, the different responses to nutritional labels along the lines of education and race was evident (see Stokes 1972).

The issue of the characteristics of the consuming public is also relevant to energy consumption labeling. The energy consumption data will be complex performance data. Given this, one would hypothesize

that the disclosure would be more effective for high-education consumers when compared to low-education consumers. It is possible that this could insure the success of the program. If the high-education/high-income consumer uses the greatest amount of energy for home appliances, the potential for energy savings would be greater for this segment of the population. This sort of broad statement cannot be made without additional knowledge of the consumption patterns of various classes of consumers. This study will attempt to gain insight into the relationship between the characteristic of education and the disclosure of energy consumption data.

Two major limitations should be kept in mind with regard to this hypothesis. First, the study will only use one product class as experimental stimuli. Consequently, the broad generalizability to other major home appliance disclosure will be limited. Second, the sample of respondents is not reflective of the characteristics of the general population. The sample is a non-random sample of residents of Gainesville, Florida. The sample reflects a desire to achieve variance along the lines of education and income. But, the ability of the sample to mirror the ultimate impact is limited.

The hypotheses were tested in an experimental setting. The research is designed to gain insight into the impact of alternative disclosure formats and the impact of energy labeling in general. To accomplish this goal a set of six experimental conditions were employed. Each of these manipulations is discussed in the following section.

Experimental Manipulations

The focus of this research is the proposed disclosure of energy consumption of major household appliances. At present this disclosure is mandated by the EPCA, and is prescribed to be the annual energy use in dollars plus a range of annual dollars for similar products. While the act will serve as a foundation for the tests to be run within this study, a key assumption is made with regard to the disclosure format. The particular manner or form of the disclosure must stand the test of consumer impact before the specific requirements or formats can be determined. Thus, while the disclosure is recommended within the act, the disclosure to be ultimately required is subject to empirical investigation.

Generally speaking, the manipulations to be discussed will address two fundamental questions:

1. Does this disclosure of energy use data on a label attached to major home appliances have an impact on behaviors related to consumer purchase decisions?

2. Does the reporting format specified by the energy act perform best in light of other format alternatives with regard to "aiding" consumer purchase decisions?

These questions have essentially been addressed in the preceding hypotheses. The first question is addressed to the classical question of impact. At what level of impact do the uniform disclosures of product performance appear to affect consumer behaviors toward a specific product? The second question is a less common approach with regard to investigation of the impact of specified disclosures. This questions

the format of the disclosure and adopts the tactical orientation of which format is most successful.

The question of format alternatives leads to the determination of the independent variables, which could or should characterize a particular disclosure.

Independent Variables

The independent variables selected for study are the unit of measurement, the time period over which the consumption will be computed, the presence of comparative information, and the degree of disclosure.

Unit of Measurement

An issue related to the public policy decision that has continually been suggested as needing research activity is the question of the unit of measurement by which information is disclosed. Both Day (1976) and Wilkie (1976) assert that little systematic research has occurred with regard to this aspect of the format decision, and that this is a necessary area of inquiry. Research conducted by CRI/FDA with regard to nutritional labeling tested alternative units of measurement (% RDA, graphics, or verbal) in an attempt to determine the "best" format for nutritional content disclosures (Stokes, 1972). The results of this study provided meaningful inputs into the policy decision. A recent study by Chestnut (1976) attempted to test the alternative units in an energy consumption setting, but this issue was clearly not the focus of the research effort; thus, conclusions are limited.

This is a very complex area, and the particular fixed levels tested under this independent variable represent a crucial decision. For most consumers, energy consumption is a cost that must be paid in more or less regular intervals. Thus, the most familiar method by which consumers address energy consumption is with regard to dollars, which must be exchanged for energy use. The fact that this is the more common method leads one to assume that the dollars disclosure would be most effective. In fact, the degree of familiarity has been linked to positive impacts of information programs with the dimension disclosed (Day and Brandt, 1974). However, there exists some unique aspects of energy disclosure problems.

First, the absolute level of familiarity, with regard to energy, may be relatively low. While the costs of energy are reflected in bills each month, the amount of the bill gives little information about energy consumption sources or the composition of the bill. Thus, familiarity with dollars as a means of disclosure may not be as strongly related to disclosure effectiveness. It is also highly likely that the consumers do not know the rate (dollars per unit of use) by which that bill is computed.

Second, the disclosures as mandated in the EPCA will be calculated on a standard rate per energy use (e.g., 4¢ per KWH). From this calculation the consumer would be able to make relative judgments as to energy consumption, but the absolute judgments (i.e. how much will this cost me?) would deviate as the rates for energy use deviate from the calculated rate. Given the particular situation which confronts the consumer, this can be a potentially deceptive situation. Energy

rates vary greatly by season and by geographic area; thus, the presentation of a standard dollar performance figure does not reflect the energy usage correctly. By presenting the energy consumption in KWH, the consumer with knowledge of local rates can correctly anticipate the energy consumption that would be associated with a given product in addition to being able to make relative judgments.

Thus, the unit of measurement decision will be tested using two levels: dollars and KWH. The dollars disclosure is the current mandate, while the KWH disclosure provides flexibility with regard to energy consumption perceptions. Each of these disclosures will be tested at all levels of impact so as to provide a more complete profile of the comparison. While these alternatives do not exhaust the various levels of this independent variable, the tests do reflect realistic and reasonable policy alternatives with regard to energy provision.

Time Period Used for Computation

While the relative energy consumption will remain the same, the time period employed to compute the energy consumption figures affects the absolute magnitude of consumption and subsequent product differences. The issue of magnitude of disclosure has received some mention with regard to public policy activities. In a position paper on unit pricing, Monroe and LaPlaca (1972) state that particular weight chosen to compute unit prices (per ounce, per pound, etc.) may have contributed to the lack of positive findings in unit pricing studies. The crux of their argument is that as the magnitude of differences between products and the absolute level of the information increased, the effect of the

disclosure would increase. Thus, while the relative positions remain unchanged, the greater the magnitude the greater the impact. With regard to unit pricing, no research has addressed this problem.

When considering the energy provision program, the issue of magnitude of disclosure becomes relevant. Would disclosure of the same relative information expressed in different time levels (i.e. yearly, monthly, over the life of the product) result in different responses? The disclosure is specified to be computed in yearly terms with the assumption that this represents the optional time period over which to compute and disclose the energy consumption. However, the consumer is faced with energy consumption in monthly increments, and since the impact of the disclosure must be considered within the budget of the consumer, it may be that this type of disclosure would be best. In contrast, the longer the time period used, the greater the magnitude of the disclosure. If the contentions of Monroe and LaPlaca are correct, the greater magnitude would result in the greatest impact. As an extension of this line of reasoning, the MIT study (MIT, 1973) reports energy consumption over the expected life of the product as a component of the product's "life-cycle costs." It might be expected that the larger magnitude of this disclosure would result in greater impact than either of the two previously discussed levels (i.e. yearly or monthly).

This study will investigate the differential impact of the yearly and monthly disclosures. Other on-going research has undertaken the life-cycle cost framework (see Hutton, 1977). The primary question

is whether the time period over which the consumption is computed will have differential impact.

Comparative Information

The disclosure of the range of comparative information provides a new dimension for policy disclosures: relative energy consumption. This form of disclosure has some real potential advantages for the consumer. The consumer can make accurate good/bad judgments with regard to product performance without the necessary shopping behavior attendant to setting performance standards. The comparative judgments of the consumer should be facilitated by the disclosure and the extent of the shopping behavior necessary to make this judgment should be lessened. Thus, the disclosure may be justified in terms of a broader "right to know" rationale. However, the question of interest is whether or not the disclosure facilitates the judgments. This leads to some rather complex issues.

First, it is very difficult to establish sound criteria for a comparative disclosure. In the voluntary labeling program (McGuire, et al., 1975) the range of comparative values for air conditioner energy efficiency ratios was done by size. However, using size as the criteria for refrigerators gives little indication of the causes of the energy consumption or the particular feature trade-offs available. Conversely, if the range were set up by similar features, the inferences concerning size would not be reflected accurately, but the consumer would have a better grasp of the effects of various feature combinations. The crucial consideration is that the criteria for the

range reflect the dimension which results in the variance in energy use found across products.

Second, given a correct (valid) range, the consumer must make correct judgments with regard to the value within the range. Thus, a model may be a high user of energy, but relatively good considering the particular feature combination. Thus, when making statements about the range there must be confidence that the measurements have tapped the judgments from the comparative disclosure dimension and not some other aspect of the disclosure.

The EPCA provides little guidance with regard to this particular dimension. The prescription is for a "range of annual dollars for similar products." Products can be similar along a number of dimensions. The manipulation chosen for this study is that the range of comparative values be for models with similar features and sizes. It is felt that this reflects the source of variance of the energy consumption between products.

However, the range of values is difficult to investigate and the insights gained from this manipulation cannot be conclusive. This is particularly true given the critical nature of the issues surrounding the exact operationalization of the range. Thus, the attempt is to make statements concerning the impact of comparative information given the constraints of this particular operationalization.

The Degree of Disclosure

The final set of manipulations center on the extensiveness of the disclosure. A major orientation of the EPCA centers around the recognition of energy sources and reduction of the demand for those sources. With regard to major household appliances, the source of much of the variance in energy consumption is the features available for inclusion on a given product.

Under the present EPCA requirement, the consumer is required to make rather complicated trade-offs and mental calculations in order to accurately identify the sources of energy consumption. In many cases the consumer is evaluating few models, and thus, this sort of judgment (feature energy use) is even more difficult. The question addressed is whether more explicit disclosures will result in more accurate judgments and/or ultimately less demand for energy-related features. This type of disclosure would seem to be closely tied to the spirit of the act.

It seems that the disclosure of energy use by feature in addition to the total model energy use, would serve a clarifying function for the consumer, and reduce the task which would be necessary to mentally make such judgments. This disclosure would be standard, and each model containing such a feature would present the same incremental energy-use information. A disadvantage is that the feature information increases the information available to the consumer. While detrimental effects of information load are not expected (see Jacoby, et al., 1975 a,b), the increased information may result in less recall overall.

Treatment Conditions

Each of the levels of each independent variable represent feasible dimensions for a study within a given disclosure requirement, and could reasonably be expected to affect the impact of the disclosure. The presence of such a large number of independent variables represents a formidable experimental design. If each of the four independent variables were to be investigated at two levels (i.e. dollars and KWH within the unit of measurement) a completely crossed factorial design would require 16 cells. Given both the time and monetary constraints for the present study the number of cells had to be reduced. However, each of the dimensions were deemed to be an important format dimension and worthy of study. The procedure for choosing treatments was to consider each combination of the independent variables along two lines. First, each disclosure format represented a combination of the four independent variables. The most urgent consideration was whether the format of the disclosure represented a viable policy alternative (i.e., one which, if the empirical results justified, would have a probability of being implemented). So the first consideration was the usefulness of a disclosure format to the actual policy decision. The second question centers on the degree of insight which could be gained from the disclosure format with regard to the independent variable levels present in a given treatment. Because a factorial design was not used in a completely randomized design, the results will not provide a test of the main effects of the independent variable. But, the format alternatives can be expected to provide comparisons with regard to the other

alternatives under study, and with a careful comparison procedure, one can gain insight into the relative effectiveness of a certain independent variable. The usefulness of these results can be seen from both a strategic and hypothesis-generation point of view. A disclosure's effectiveness can be given empirical validation by the results of the experimental setting. Also, if the effects after the comparison procedures support the effectiveness of a format alternative, additional experiments can be attempted to clarify and substantiate the impact of certain independent variable considerations.

The following discussion presents the treatment conditions chosen for study. The treatment conditions in order of discussion are as follow:

- Condition 1 - a control condition which has no energy consumption data available;
- Condition 2 - energy consumption data in annual dollars with a range of comparative annual dollars for similar products;
- Condition 3 - energy consumption data in annual dollars with a range of comparative annual dollars for similar products plus the annual energy consumption of each product feature;
- Condition 4 - energy consumption data in annual kilowatt hours with a range of comparative annual kilowatt hours for similar products;
- Condition 5 - energy consumption data in monthly dollars with a range of comparative monthly dollars for similar products; and,
- Condition 6 - energy consumption data in annual dollars.

Control - No Energy Data

The energy labeling program is in response to the overriding problem of energy shortages. In order to accomplish a redirection of energy-related activities, the policy makes an implicit assumption that the current information environment is insufficient. And, further, the program assumes that the disclosure of energy consumption data will affect purchase-related behaviors. To attest to that impact, the current information environment must in some way be related to the changed information environment (one with energy consumption data available). Consequently, the comparison of the control condition with the disclosure alternatives is necessary for this measure of impact.

It should be emphasized that the control condition represents the current information and consuming environment. Not only is energy consumption information not available, but there is no attempt to sensitize any of the groups to the energy dimension via some surrogate consumer education efforts. Thus, the comparison of control vs. treatment represents the impact of energy on situations where the energy consumption data is not present.

The comparison with the control condition will be made across all levels of impact. Special care has been taken to insure that the only major difference between the treatment and control conditions is the presence of the energy consumption data. The following treatment conditions are conditions which present the same energy consumption information in different formats. Thus, in each condition the energy

consumption of the alternatives is in the same relative values for the models. Some condition may transform the energy consumption into different units or report consumption over different time periods, but in each case the consumption of a particular object (model) remains the same. This is a crucial aspect of the disclosure, in that for some analysis the conditions must be combined to gain a feel for the effects of certain independent measures. By classifying the conditions as the same information transformed into a different format, it is possible to make that particular combination of different treatments have some conceptual meaning. What is being combined is the same information that is communicated in different format. Thus, when all treatment conditions are compared to the control, the treatment conditions do not represent conceptually different objects and, thus, the comparison has meaning in an information-no information sense.

Energy Consumption in Annual Dollars Plus a Comparative Range

This treatment condition represents the requirements of the EPCA as the disclosures are presently stated. The inclusion of this condition represents a crucial test for the energy policy. It is an essential component of the assessment of the impact of the energy consumption disclosures. Also, this treatment condition is essentially the comparison group for the other disclosures, addressing the question of which disclosure format is the most effective. Thus, the contrast of this comparison condition with either disclosure formats will allow for the judgment as to which format best aids the consumer in purchase-related activities.

This condition provides a combination of the levels of three of the independent variables. The EPCA specifies the disclosure to be in dollar units, with consumption aggregated over a year, and provide a range of comparative values. The comparison with conditions using different levels of the independent variables will be conducted.

Energy Consumption in Annual Dollars Plus a Comparative Range Plus By Feature

This manipulation represents the addition of more explicit energy information disclosure than that proposed by the EPCA. What is assumed is that the disclosure of energy use in terms of simply annual overall consumption of energy requires that the consumer assume the burden of determining the incremental contribution of a feature toward the model's or product's overall energy consumption. Thus, the feature disclosure provides a more explicit disclosure not only of the total consumption of energy, but also of the source of that consumption. The format also provides the standard disclosure as specified by the EPCA, thus facilitating a comparison as to the effect of this additional disclosure.

Energy Consumption in Annual KWH Plus a Comparative Range

The next treatment presents the energy consumption again on an annual basis with comparative information, but uses a different unit of measurement. Given the added flexibility of this unit of measurement, it would seem that the format would offer some advantages. With the fluctuating cost of energy between seasons and geographical areas, the flexibility offers the consumer greater potential accuracy with regard to absolute consumption. The comparison of this alternative to

the EPCA disclosure will provide insight into these levels of the unit of measurement variable.

Energy Consumption in Monthly Dollars Plus a Comparative Range

The presentation of energy consumption aggregated by month represent a reasonable policy alternative to that proposed by the EPCA. The consumer is familiar with energy consumption disclosed in this manner due to the common billing practices. Thus, even though energy consumption is typically a continuous process due to billing and budgetary considerations, the consumer may be most familiar with this format of disclosure. The question, however, stems not only from the consumer's choice for disclosure, but to the empirical impact of format alternatives. This remains an untested question.

Energy Consumption in Yearly Dollars

The typical disclosure of product performance information presents only the performance of the specific product and heretofore has given no explicit or implicit indication of the relative evaluation of that performance. As performance standards become more and more complex, the task of developing these standards by shopping, experience, etc. is an unreasonable request of the consumer. Thus, the presence of comparative data should relieve this burden. The condition without comparative data facilitates this comparison.

Experimental Vehicle

Product Class

The product class chosen for the experimental stimuli is a refrigerator-freezer. The following criteria were used in the selection of this particular product:

- The relevance of the product class to the energy consumption information program. The program deals with major home appliances of which refrigerator-freezers represent a large volume of major appliances purchase in both per capita and dollar volume terms.
- Refrigerator-freezers represent the single greatest source of household energy consumption (see MIT report in previous chapter).
- The variability in energy consumption of refrigerator-freezers is related to both feature and model decisions.
- There exists a potential for energy savings with respect to product technology which represents a potential for impact of energy consumption disclosures.
- The product occupies a prominent place in the American household; consequently, the population can be expected to possess a certain amount of product knowledge.
- The product is not characterized by unique consumer usage patterns.

With respect to the product class of refrigerators, the great diversity of model/feature combinations allows flexibility with regard to the specific selection of experimental stimuli. Also, the choice of a refrigerator is characterized by model decisions. Even if a consumer shops within only one brand, the decision becomes a model choice. Consequently, this frees the research from a brand choice orientation to a model evaluation framework.

Attribute Choice

The following attributes were available in the model evaluation task:

1. style,
2. price,
3. frost-free,
4. size,
5. icemaker,
6. insulation; and,
7. energy use.

The attributes were all attributes which were mentioned in the focus group interviews conducted earlier. For the most part, each attribute is related to the model energy consumption. This also coincides with the type of information which is readily available on current products, should a consumer choose to evaluate a particular model. Further, each of the features relate to energy consumption in certain ways.

The combination of the attributes produced the particular models which the respondents evaluated. Each consumer was faced with four models of refrigerator-freezers to evaluate. These models were: MODEL 1 - Top Freezer Style with Manual Defrost; MODEL 2 - Top Freezer Style with Frost-Free Defrost; MODEL 3 - Side-by-Side Style with Frost-Free Defrost and Icemaker; and, MODEL 4 - Top Freezer Style with Frost-Free Defrost and an Icemaker. Within each model each attribute took on different values. Table 7 presents the values chosen for each of the model attributes. Thus, the models differed along the lines of style, size, price, defrost insulation, and icemaker. The values of the dimensions were chosen to represent model types which would be

Table 7

Attribute Values of Experimental Models

Name	Model 1	Model 2	Model 3	Model 4
	top freezer style with manual defrost	top freezer style with frost-free defrost	side-by-side style with frost-free and an icemaker	top freezer style with frost-free and an icemaker
Price	$359.00	$439.00	$669.00	$589.00
Size	17 cubic feet 13 fresh food 4 freezer	17 cubic feet 13 fresh food 4 freezer	19 cubic feet 13 fresh food 6 freezer	20 cubic feet 15 fresh food 5 freezer
Frost-Free	No	Yes Frost-free adds $100 to the purchase price (and adds $25 each year to the energy use).	Yes Frost-free adds $100 to the purchase price (and adds $25 each year to the energy use).	Yes Frost-free adds $100 to the purchase price (and adds $25 each year to the energy use).
Insulation	Poured insulation. Adds $20 to the purchase price and subtracts $7.50 each year from energy use.	Cut fiber glass--standard.	Cut fiber glass--standard.	Cut fiber glass--standard.
Icemaker	No	No	Yes Icemaker adds $75 to the purchase price and $12 each year to the energy use.	Yes Icemaker adds $75 to the purchase price and $12 each year to the energy use.

found in appliance stores. This was accomplished by several visits to local retain outlets of such brand names as Philco, G.E., Coldspot, Whirlpool, and Frigidaire. The author consulted models on the floor and dealer material to determine the price increase of additional sizes and features.

The models represent realistic model alternatives, but they, in addition, provide trade-offs on the features which account for refrigerator-freezer energy consumption. The effect of each feature on energy consumption was accomplished by consulting the 1976 Directory of Certified Refrigerator-Freezers. This source allowed for the computing of average model energy consumption. It was determined that on the average, frost-free increases energy consumption $25.00 each year; icemaker increases energy consumption $12.00 each year; side-by-side $10.00 each year; and, poured insulation decreases energy consumption $7.50 each year. From these average figures The Directory was consulted to determine the range of values for similar models. Table 8 presents the values on the energy use attribute. The values were chosen to reflect three models (MODELS 1, 3, 4) which were in the lower-energy use portion of the comparative range of energy consumption and one model (MODEL 2), which was in the high-energy use portion of the comparative range of energy consumption values. The values for each model's energy represent models which possessed the features of the experimental stimuli in various brands. Thus, while the models were fictitious, there exists a model in the real world which has the same features. The actual displays of the model information was accomplished

Table 8

Energy Consumption by Model by Treatment

	Model 1	Model 2	Model 3	Model 4
Control	None	None	None	None
Dollars/year plus a comparative range plus by feature	$32.40 each year. Similar models use $32.40 to $50.80 each year.	$101.00 each year. Similar models use $60.00 to $108.00 each year.	$96.80 each year. Similar models use $93.70 to $168.60 each year.	$76.80 each year. Similar models use $75.00 to $135.00 each year.
Dollars/year plus a comparative range	$32.40 each year. Similar models use $32.40 to $50.80 each year.	$101.00 each year. Similar models use $60.00 to $108.00 each year.	$96.80 each year. Similar models use $93.70 to $168.60 each year.	$76.80 each year. Similar models use $75.00 to $135.00 each year.
KWH/year* plus a comparative range	648 KWH each year. Similar models use 648 to 1016 KWH each year.	2020 KWH each year. Similar models use 1200 to 2160 KWH each year.	1956 KWH each year. Similar models use 1874 to 3372 KWH each year.	1572 KWH each year. Similar models use 1500 to 2178 KWH each year.
Dollars/month plus a comparative range	$2.20 each month. Similar models use $2.20 to $4.23 each month.	$8.42 each month. Similar models use $5.00 to $9.00 each month.	$8.15 each month. Similar models use $7.81 to $9.70 each month.	$6.55 each month. Similar models use $6.25 to $11.34 each month.
Dollars/year	$32.40 each year.	$101.00 each year.	$96.80 each year.	$76.80 each year.

* computed by dividing the dollars per year by $.05 per KWH to obtain KWH/year. $.05 is the Gainesville, Florida rate.

by arraying the attributes and values for each model around a drawing of a refrigerator. Figures 1 and 2 illustrate the drawing for the side-by-side and top freezer styles. The actual stimulus material is available in Appendix A through for each model within each treatment condition. The subjects worked through a series of tasks using the model displays a stimuli. Thus, the judgments for the first section of the tasks were limited to the four models and the attendent information. However, in the last task the respondents were asked to make certain choices in the form of a building task.

The building task operationalized product choice in a unique fashion.

Since the subjects were asked to design the refrigerator to meet their personal needs, the task had to be arranged so that the flow of the task made sense. This was accomplished by having the respondents take the features in the order that the feature would be placed or built on a model. The features and alternatives within each feature were: total size (16, 17, 18, 19, 20, 20+ cubic feet); style (side-by-side, top freezer, bottom freezer); color (white, colors); insulation (cut fiber glass, poured insulation); defrost (manual, partial automatic, frost-free); icemaker (yes, no); shelves (stationary, wire shelves, adjustable wire shelves, stationary glass shelves); power miser (yes, no); and cold-water dispenser (yes, no).

The respondents were confronted with each alternative within a feature and the price (purchase price) of that feature. The prices corresponded to the prices which were given to the models evaluated

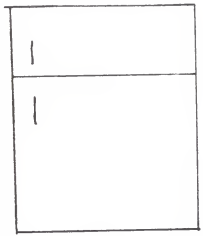
earlier, so that if a consumer designed a model with exactly the same features as MODEL 1, the price would be $359.00. The task and attribute values for the building decisions are found on pages 13-15 of Appendix A.

This chapter has presented the hypotheses to be tested and experimental manipulations used to test these hypotheses. The following chapter will discuss the Research Methodology.

Figure 1

Model Display for MODEL 1, 2, 4

Model Description



PRICE

SIZE

FROST FREE

ENERGY USE*

INSULATION

ICEMAKER

*available only in the disclosure conditions

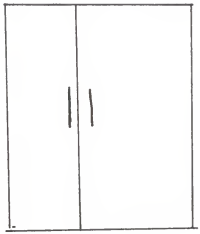
Figure 2

Model Display for MODEL 3

Model Description

PRICE

SIZE



FROST FREE

ENERGY USE*

INSULATION

ICEMAKER

*available only in the disclosure conditions

CHAPTER IV
RESEARCH METHODOLOGY

Introduction

The concern with assessing the effect of information oriented disclosures has developed into a crucial research issue. The need is to integrate the goals and direction of a given policy activity with the standards of research conduct in such a manner that the needs of both are satisfied. This research has taken the posture of focusing on the particular policy activity as the foundation of the research endeavor. At the onset, the research goals centered upon an attempt to assess the impact of the disclosure of energy consumption data on the consumer. As a subset of this major goal, the research is attempting to determine where and why the impact would take a particular shape. The following is a more explicit statement of the research goals of this project.

Objective One

While attempting to identify alternatives to present energy sources the government has determined that present demand for energy must be affected (i.e. lowered). The provision of energy consumption data on labels is directed toward this goal. While the program is in early stages of development, there is a need to attempt to gauge the impact of the disclosure on consumer purchase/product evaluation behavior. The first objective is to gain insight into the impact of the disclosure of energy consumption data.

Objective Two

The second goal of this research is to determine the effect of the disclosure by measuring specific levels of impact. As discussed earlier, the orientation of much policy oriented research is to determine the choice differences due to disclosures. Choice remains the ultimate impact criterion, but it must be noted that often when this becomes the crucial dependent measure the emphasis becomes decision (especially brand) rather than evaluation oriented. This orientation provides a rather incomplete picture of impact. This objective attempts to measure the levels of information use in order to more realistically assess the variation in response due to the disclosure.

Objective Three

One of the often suggested but infrequently tested questions concerning standardized disclosures revolves around the issue of disclosure format. Does the form of the disclosure provide for, or prevent the positive impacts of a given program. A large number of independent variables come to mind, the unit of measurements, the time frame of a disclosure, the presence of comparative information, etc. The third objective of this study is to determine if there appears to be significant differences due to certain dimensions which alter the form of the disclosure.

Objective Four

The final objective is more global. This study has attempted to represent a framework for performing policy-oriented research. The focus of the study and subsequent design and methodology reflect the

unique considerations of a policy and, consequently, the results should reflect partial answers to the policy oriented questions.

Experimental Design

The design contains five treatments varying certain important dimensions of the disclosure of energy consumption data plus a control group. The five treatment groups disclosed energy consumption as follows:

- dollars of energy consumed each year with a range of energy consumption values for similar products, plus each energy related feature had the energy consumed each year in dollars for that feature,
- dollars of energy consumed each year with a range of energy consumption values for similar products,
- kilowatt hours of energy consumed each year with a range of energy consumption values for similar products,
- dollars of energy consumed each month with a range of energy consumption values for similar products, and
- dollars of energy consumed each year.

Included in this design is a no energy consumption control group which received all information about each of the products except energy consumption.

Experimental Controls

A complete set of controls was used to establish the source of effects which were observed. Subjects were randomly assigned to one of the experimental groups. The subject pool was such that the sample was composed of members of existing organizations. This resulted in several experimental sessions composed of the members of a particular organi-

zation. Each treatment was represented at every experimental session, and the subjects were randomly assigned to the treatment. If the location of the session was such that the subjects could, with a measure of certainty, work alone the seating arrangement randomly mixed the treatment conditions. If, however, the location was characterized by close working conditions, the treatment groups were separated and the random assignment occurred as the subjects entered the room. In retrospect, the random assignment to physically separated treatment areas is preferred due to the potential communication among subjects, thereby controlling a potential source of interpersonal communication. The random assignment of treatments once seating had been accomplished produced the least amount of reaction by the experimental subjects.

The conduct of the experimental sessions was uniform with regard to the instructions given to the sessions. In all but one session, the experimenter was the author. In the session with a different experimenter, explicit, written instructions were used, and identical visual aids were employed. In all sessions, the interaction of the experimenter with subjects was standardized by use of the experimental instrument. Due to variability between the tasks contained in each session, the total time of each session varied. The time period ran from 45 minutes to a little over one hour.

Further, each subject, regardless of the treatment group, received the following material:

- human subject release form,
- a questionnaire,
- an acquisition board,
- a large envelope containing the models to be used in the acquisition task, and
- small envelope containing models for the evaluation section of the experiment.

Conduct of the Experiment

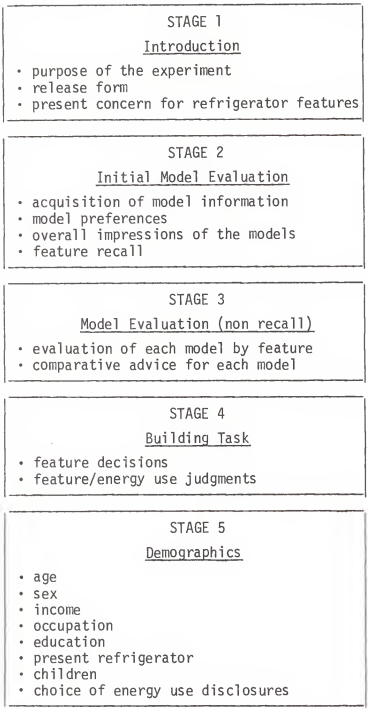
The stages of the experimental tasks are presented in Figure 3. The experiment consisted of five major stages; introduction, information acquisition, model evaluation, building task, and personal data. The following is a description of the conduct of each experimental session.

Introduction

The experimenter introduced himself and briefly stated that this research was a part of the author's dissertation. Subjects were then asked to read the human subject release form, Appendix H. Upon reading the release, each subject indicated her consent by signing the form. The experimenter explained that to insure anonymity, the release forms would be picked up immediately and not associated with their responses. Upon completing this, the subjects were asked to look at the cover page of the questionnaire and to read along with the experimenter. It was stressed that there existed a wide range of questions and their responses should reflect each subject's personal opinions. If a subject had a question, either the experimenter or one of the individuals assisting in the session would be glad to answer the question personally. The Appendix A contains the completed questionnaire and instructions for reference.

Figure 3

Conduct of the Experiment



Subjects were then told to turn to page 1 of the questionnaire and to read along with the experimenter. Subjects were then given 2-3 minutes to list those items which they, as consumers, would take particular care to evaluate. Upon completion of this task, subjects were told to turn to page 2, and again read with the experimenter. The experimenter then gave an example of how to use the scale if a characteristic were not at all important, moderately important, and extremely important. Upon completion of this page, subjects were to stop before continuing on to the next page.

Initial Model Evaluation (Acquisition)

The first task requested the subjects evaluate the four models of refrigerator. The experimenter read along with the subjects a section describing the four models. The subjects then read silently a description of the type of information available. Upon completion of this reading the experimenter explained the process by which this information was to be gathered.

Essentially, the acquisition task is a modification of the task pioneered by Jacoby and his associates (see Jacoby, 1974 a,b). The subjects are confronted with an information display containing tabs associated with the product attributes. A tab would contain the attribute information for that attribute/brand combination. To gather the information subjects would pull the tabs and maintain the order of acquisition.

This experiment uses the acquisition task to model an initial exposure to the models on an in-store shopping trip. Thus, the model

information is provided on separate model displays, just as subjects would encounter information in an actual product encounter. The subjects were told by the experimenter that the pulling of the tabs, and placement on a cardboard with adhesive strips, allowed for a record of "where their eyes go when they look at a refrigerator."

The subjects were visually instructed as to the mechanics of information acquisition. Further, subjects were told they were to look at only models they might be interested in evaluating. Consequently, each subject could pull any or all the tabs as often as they wished.

Subjects were given approximately 8 minutes for information gathering. The displays and acquisition boards were then placed under the chair of the subjects and the questionnaire was open to page 5. Subjects were told they would be asked 9 questions about the models. They were told that not everyone pulled tabs, but they should be able to make a guess at each question. Also, that on the first visit to a store you can't remember everything that you read about the models, consequently subjects should not feel overly discouraged if they could not remember some specific aspect of the models. The model description, as it appeared on top of the displays, was placed in front of the group. Subjects then answered the 9 questions on the following two pages, model preferences, overall impressions, and recall rankings on size, price, features, and energy use. This ended Part I and subjects were told that the hard part was over. The average time spent on Part I was 30-35 minutes.

Model Evaluation

Upon completion of the recall questions, subjects were told to turn the page and read about Part II along with the experimenter. Subjects were told that they would not have to rely on memory for the questions, and were told to open the second envelope and remove the model displays. (The actual displays are available in Appendices B-G). Subjects were told that they could use this information to answer the questions in Part II, and that this is the same information that was available in Part I had they pulled all of the tabs. Subjects were then instructed to complete the questions on the next three pages, attribute evaluation for each model. Upon completion of these questions, subjects were to stop and wait for further instructions.

The next section involved giving personal advice about the models. This section was designed to test the impact of the comparative disclosures. The experimenter read the next set of instructions and cover story to the subjects, and reemphasized that the model information should be used to give advice. In addition, the experimenter asked the subjects to place Model 1 in front of them and answer the first three questions, and repeated this for Model 2, 3, and 4.

Building Task

The next task involved the design of a refrigerator for the individual subjects' homes. The subjects accomplished the building task by making a series of nine (9) feature choices. Within each feature decision subjects had a choice within the feature decision; for example, there were six different sizes to choose from. Following

the initial decision on each feature, the subjects were to respond to a question measuring strength of choice, and where appropriate a second choice was elicited.

Some clarification may be instructive at this point. The rationale for this type of behaviorial decision is linked to the direction of this study. The behaviorial dimension has typically held a large amount of responsibility in program evaluation research (i.e. does the information effect choice). The choice dimension has usually been object choices, predetermined combinations of attributes. The major home appliance decision, particularly refrigerator-freezers, is a complex set of decisions which would result in a combination of attributes (a model), but the model choice does not capture the process of that choice. Given the need for careful interpretation of impact it was felt the series of discrete choices, a building task, would provide a more complete view of the choice dimension. Thus, the impact of energy use on choice may be viewed, using this task, from an object point of view (summing the attribute choices) or from an attribute decision vantage point.

After completion of the building task, subjects were told to continue through the remainder of the questionnaire. Clarifying remarks were made for the matching task, and, finally, subjects filled in the demographic questions on the final two pages.

At the completion of the task, subjects were thanked for participation and the contribution was made to the organization.

Comments on the Experimental Procedure

The experimental task was subject to varying degrees of success. The overall judgment was that the sessions went well. The acquisition task was not uniform across the experimental groups, and consequently, will be used only descriptively. The deficiencies of the acquisition task stemmed from three main sources. First, the author did not rigorously pretest the task with a representative sample. The task itself is difficult in the degree of abstraction, and the need for visual, as well as written, instructions became apparent.

The second major reason for the relative lack of success stemmed from the working conditions. The use of acquisition task should be facilitated by small experimental groups with enough space to perform the task without contamination of the other respondents. The facilities encountered did not uniformly meet this criteria. This was a particular problem with the earlier groups when the situation was coupled with relatively incomplete visual instructions.

The third reason stems from the difficulty of the task with regard to the subjects' ability. The respondents found this task to be difficult even when instructions were understood. This may be reflective of real world shopping endeavors, but presents problems experimentally. The task of evaluation of a particular refrigerator-freezer model is a difficult one. To accomplish this task, an individual carries a whole set of expectations and beliefs. When the situation encountered by the individual is in fact an abstraction of the real world, a match between the expectations and the situation is

difficult to achieve. Some time should be spent orienting the respondents. This causes the overall experiences with the acquisition task to differ slightly between experimental groups. In retrospect, the initial acquisition task could have been a forced exposure to the data on each model, which focuses on the effects, rather than the process of acquisition.

The final section presented few problems in terms of the conduct of the experiment. The respondents were able to handle the evaluation task and building task rather quickly and seemed to be comfortable with the task. The sections were characterized by the joint reading and listening to the instructions relevant to a particular section. This manner of instruction appeared to be more acceptable and overcame the difficulty with regard to subjects' poor reading ability or perhaps unclear instructions.

The order of the task was an additional positive aspect of the experimental setting. The presentation of the difficult task early, followed by less taxing sections seemed to favorably affect the subjects' attitudes toward the task, and made the session appear shorter. Perhaps the difficulty encountered in the acquisition task could be remedied by a forced acquisition, rather than the type of task utilized in this study.

In general, the experiment was conducted smoothly. And with minor adjustments in instructions, the task seemed to be acceptable to the respondents. In most cases, the subjects seemed to express a real interest in the study, and to enjoy participating.

Sample

The composition of the sample was characterized by female subjects who were members of eight organizations located in Gainesville, Florida. A total of 180 respondents were randomly assigned to each of the six treatment groups. The completed sample consisted of 155 housewives for a completion rate of 86 percent. A Chi square test indicated there is no relationship between the completions and the treatment groups. Subjects were judged to be acceptable for inclusion in the sample due to completion of the tasks. Since the session was characterized by two independent parts, subjects could be included if one or more of the parts were complete. The completed sample is shown in Table 9 by each experimental group. Table 9 presents the total number of usable subjects by treatment from each of the organizations. A Chi square (19.748, df=45, p=.99) analysis of this table shows no relationship between the treatment assignment and the experimental session. This would also refute the contention that the results of the treatments might be due to an irregular assignment of subjects, thus loading the sample toward significance.

As the table indicates, the final sample size per treatment is not equal. However, the cell size of 25 was determined to be adequate for analysis purposes.

Table 9

Sample Composition by Experimental Groups

Group	Control	$/year plus a range	$/year plus a range by feature	KWH/year plus a range	$/month plus a range	$/year	Total
Holy Faith Catholic Church	5	5	5	5	3	4	27
Westwood Middle School	3	4	3	4	5	4	23
Bethel A.M.E. Church	1	2	4	3	3	2	15
Highland Manor Club	4	4	3	3	3	3	20
Howard Bishop P.T.O.	4	4	5	5	4	5	27
Business secretaries	4	1	2	2	3	1	13
Law secretaries	2	3	2	2	3	4	16
Jaycee Wives	3	2	2	2	3	2	14
	26	25	26	26	27	25	155

Table 10

Demographics of the Sample

Age	n	
20-25 years old	23	
26-30 years old	19	
31-35 years old	27	
36-40 years old	29	
41-45 years old	14	
46-50 years old	12	
50+ years	26	
	151	
Occupation	**respondent**	**spouse**
housewife	51	--
management/professional	13	58
sales/skilled	9	30
student	3	8
education	18	5
nurse	10	--
secretary	25	--
other	9	10
	138	111
Education	**n**	
some high school	7	
completed high school	30	
some college	46	
completed college	59	
	142	
Income	**n**	
$ 0 to 4,999	5	
5 to 9,999	17	
10 to 14,999	34	
15 to 19,999	36	
20,000+	46	
	138	

Sample Characteristics

The sample was composed of housewives who were members of local organizations in Gainesville, Florida. The sample was obtained through the Central Florida Research Group and all sessions were conducted during a period from July 14 to 30, 1976. An attempt to gain a sample which was representative of a more general population with regard to education, income, and age were the general guidelines used to contact the groups from which the sample was drawn. As Table 9 shows a certain amount of variability is found between age and education. However, the sample is very much a high income sample. The lack of representativeness must be considered in the results obtained.

Dependent Measures

The dependent measures were employed to measure the impact of information at three levels. The first set of measures closely resemble the cognitive level within the traditional hierarchy of effects model. However, these measures reflect not only the recall, but also the effect of the information acquisition task. The second level of response delineates the impact of the energy consumption information on the evaluation of models of refrigerator freezers. The final set of measures revolves around a behavioral choice of the type of refrigerator subjects would place in their own home. This behavioral choice was a building task whereby the subjects built a model by making feature choices.

Cognition/Recall

The cognitive responses stem from a question of information recall. The instructions for this task are as follows:

> The following statements ask you to rank the models on some features. If you feel a model is first in rank, give it a 1, the next model in rank a 2, the third model in rank a 3, and the lowest in rank a 4.

Following acquisition, the subjects were then asked to rank the four models of refrigerator-freezers on the basis of purchase price, energy use, size, and number of features. The responses were then transformed into proportions of subjects by treatment who accurately recalled the rank of the models on energy use. The accuracy measures were analyzed across treatments and with each model.

The use of ranking as a recall measure taps only one dimension of recall. However, the measure reflects reasonable expectations of a subject after a first-time gathering of product information. A minimal recall of energy information would be ordinal (i.e. does a product/model use more, or less than an alternative product/model). The use of the ranking measure removes some of the complexity of the recall. The subjects were not asked to recall or recognize actual values of energy use. It should be noted that an individual may be able to accurately recall some of the actual values, but could in fact, recall relative positions inaccurately. Consequently, for the purpose of this study, the ranking recall seems to better capture the flavor of the policy.

It should be noted that additional questions could have been asked at this point which would have provided insight into the depth of

recall. These questions would have reflected the source of energy consumption (i.e. what features should/do account for the product energy use). These measures would be particularly instructive, should the other less exact measures of recall show no significant differences. However, it was felt that the degree of difficulty regarding the recall questions should be kept to a minimum. Consequently, only the recall ranking of the four dimensions of the models was requested.

It should be stated that this portion of the task (i.e. acquisition and recall) accounted for by the greatest number of missing responses in this experiment. It presented the greatest challenge to the subjects and consequently, the limitation on the number of statements for this section appears justified.

Analysis of Energy Expectation/Recall

The data was recoded into dichotomous scales so that the proportion of accuracy can be used. This required that for each respondent judgement, an accurate ranking was coded "1" and an inaccurate ranking coded "0". The attempt is to establish a relationship between the disclosure of energy use and the accuracy of recall.

The analysis was conducted model by model. The treatments will be pooled and the Chi-square will be a 2x2 table treatment/no treatment by accurate/inaccurate for each model. The test statistic becomes a Z statistic. Due to the fact that the hypotheses with regard to the impact are directional, the Z statistic allows for greater discrimination than a non directional test.

Evaluation

The second level of response deals with the evaluative judgments that the subjects will be making regarding the alternative models of refrigerators. Subjects made evaluative judgments based on recall and non-recall.

Recall Evaluation

Immediately after the acquisition task, the subjects were asked to make two sets of evaluative judgments. The first asked for the ranked preference of the four models included in the acquisition task. The response to the preference statement is instructed as follows:

> Rank the models you have seen in order of preference. Give the model you most prefer a 1, the next model a 2, the third in preference a 3, and one you least prefer a 4.

The respondent is asked for a rank preference due to the limited amount of information available, and the lack of experience the respondents have had with the form models. The preferences were formed during an 8-minute acquisition task. Consequently, it may be difficult for subjects to articulate scaled differences in preference. But, it would be reasonable for the respondents to be able to present ordinal preferences.

The second evaluative response asks for the respondents' overall impressions of each model in the following manner;

> My overall impression of Model (1,2,3,4) is: very favorable (7); very unfavorable (1).

It was felt that the energy consumption would have a lower probability of impacting on preferences, since the preference is probably a function of the total model/feature evaluation. The presence of high energy

consumption may reflect less favorable impressions, while the respondent might persist in preferring the high energy consumption model over a low energy consumption model due to features.

In both measures, the crucial comparison will be between the treatment groups and control. The assumption being made that the energy consumption information will impact on both of these levels of evaluation (recall and non-recall). The measures also reflect reasonable judgments from respondents given the experimental task.

Analysis of Recall Evaluation

The crucial comparison will be treatment/no treatment for both measures. With regard to preference the subjects' choice of Model 2 is the crucial judgment. The measure will be tested as the proportion of respondents preferring Model 2 as "first choice" vs. the proportion of respondents not preferring Model 2 first comparing across the treatment/no treatment conditions. The form of this test becomes a 2x2 matrix and will be tested using the Z statistic to test for significance.

The overall impressions will be measured on an interval scale, consequently, the one-way analysis of variance will be used to test for significance. A significant test statistic would indicate at least one significant comparison among the different treatments. The comparison of the individual cell means will be done by the use of TUKEYS HSH and Dunnets test (Kirk, 1968). The test is each treatment versus the control condition. This type of multiple comparison necessarily precludes the use of independent contrasts (e.g. t-tests).

Consequently, a test which holds the alpha level constant over a number of comparisons, while allowing a number of independent comparisons, will be employed.

Non Recall Evaluation

The second set of evaluations involves more specific attribute judgments with respect to each model. Given the greater demands of these judgments, the respondents were not instructed to respond based on memory. The respondents were presented with information displays and responded to the following statements:

> In my opinion, the (purchase price, size, energy use, style, and features) of Model (1,2,3,4) is: good (7); bad (1).

The responses will be coded according to the scaled response. The crucial comparison is not between the groups, but between the models. The control did not have access to the energy use dimension and consequently, were not asked to give their opinion of this dimension. The test becomes whether the evaluations of the models on the energy consumption dimension were consistent with the information presented. The crucial contrast is Model 2 versus the other models.

The second set of judgments calls for evaluations of the information itself on the various dimensions. The response was to the following:

> In evaluating the 4 models, the information on (total size, frost free, energy use, icemakers, and insulation) was: useful (7)/useless (1); complex (7)/simple (1).

The responses were coded according to the scaled values on each bipolar

dimension. The dimension taps the perceptions of the disclosures across the different treatment conditions.

The third set of evaluations addresses the comparative evaluative judgments of each model with regard to similar models. These test the impact of the disclosure of the range. Three measures were designed specifically for this purpose. A rather lengthy cover story was presented to the subjects. The cover story was as follows:

> Now that you have carefully investigated the 4 models, you are capable of giving 'expert' advice on what each model has to offer. Let's assume that you are faced with the following situation.
>
> A good friend is in the market for a refrigerator-freezer and is looking among name brands, one of which is the brand which produces the models you have been looking at. Your friend needs to buy a new refrigerator very soon. She has sold her old one when she sold her home, and her new home does not have a refrigerator with it. Your friend has hurriedly called the major appliance dealers and found out that she is too late for the sales. Since she cannot get a 'deal' your friend knows that the purchase prices are about the same for the brands she is looking at. Your friend does not have the time to shop so she is calling her friends who know a lot about refrigerator-freezers for advice. Since you know about the 4 models produced by this brand your friend is calling you. One of the models your friend wants is the same as the models you have just evaluated. In order to give your advice you can use the information on the models.

Following the cover story, 3 questions were designed to test the comparative evaluations of each model. The following are the questions:

> Let's say that your friend wants a model that is the same as Model (1,2,3,4).
>
> Given that the purchase prices are about the same, would you advise your friend that if she shopped around, the likelihood that she would find a better value from another brand is: very likely (7), very unlikely (10).
>
> In this case, would you advise your friend that going to other stores to find a better Model (1,2,3,4) is likely to be: not worth the effort (1); clearly worth the effort (7).
>
> If your friend says that she has decided to buy this brand's (the brand you have evaluated) Model (1,2,3,4) would you strongly encourage (7); strongly discourage her to buy this brand (1).

A central issue is to test the qualities of this measure. The measures were carefully designed to tap three dimensions of the impact of comparative. The dimensions are the likelihood of finding a better value for the money, whether shopping is worth the effort, and the degree of encouragement of purchase behavior. These questions have face validity. However, the crucial questions revolve around the construct validity of the measures.

This can be approached in several ways. The testing and subsequent rejection or acceptance of hypotheses has been suggested as a measure of construct validity (Kerlinger, 1973). However, in many areas of social research, as in this study, the concepts under study are characterized by a high degree of abstraction. In these situations a correlational approach to validity is usually employed. This technique is termed a multi-trait, multi-method technique (Campbell and Fiske, 1959). The essence of this approach is that the measures which are purported to measure the same construct (i.e., comparative information)

should converge, or be highly correlated. This convergence gives credence to the claim that the construct under question is in fact being measured.

A second consideration is a test that the measure is not measuring some other construct. Thus, if a measure is intended to measure the effect of comparative information, it should not also measure overall impressions. It should discriminate the two constructs.

The correlations in Table 11 present the correlations to test for convergent and discriminant validity for the scales to measure the effect comparative information. The results are indicative of the validity of the scales. The comparative information scales are significantly correlated (all correlation significant at p=.001). The scales appear to be converging on the comparative information dimension. However, these results could be due to the presence of other information (i.e., the respondents could actually be indicating absolute energy consumption rather than comparative consumption). Consequently, a rather stringent test is whether the measures of the comparative information are significantly related to the overall impressions. The top row of Table 11 presents this information. The measures are not significantly related to the overall impression of the models. From this analysis, the scales designed to tap the impact of comparative information do possess degrees of discriminant and convergent validity.

The final set of evaluations was based on the respondents' opinions concerning the degree of relationship between different features of a refrigerator and purchase price, convenience, energy use, and

Table 11

Validation of the Comparative Information Scales

	Better value likelihood	Worth the effort to shop	Encourage Purchase
Overall Impressions	-.1065 (p=.105)	.0891 (p=.147)	-.0636 (p=.227)
Better value likelihood	1.0000		
Worth the effort to shop	-.3463 (p=.001)	1.0000	
Encourage Purchase	.7064 (p=.001)	-.4076 (p=.001)	1.0000

Note: all values in parentheses are the significance level for the correlation coefficients.

reliability. The subjects were to respond to the following statement:

> Now that you have considered and used different features in designing your own refrigerator-freezer, we want to know your opinions about the characteristics of different features.

The features were; frost free, icemaker, poured insulation, side-by-side, and cold water dispenser. The characteristics of each feature were; purchase price, convenience, energy use, reliability, and each was responded to on a five-point scale from strongly decreases (1), to strongly increases (5). These final evaluations represent a feature judgment.

Analysis of nonrecall evaluation

The analysis of the evaluations will depend upon the scale properties. The interval scaled measures (i.e., the overall impression, the advice statements, the information evaluation, and the feature judgments),

will be analyzed by one-way analysis of variance. With comparisons between the treatment groups being done by the use of Tukey's HSD (Kirk, 1968). The evaluation of each model's energy use will be compared within each treatment. This requires a number of comparisons, since each model within each treatment will be compared to Model 2. To insure the interpretation of the results, Dunnets' test will be employed (Kirk, 1968).

Behavior

The behavior dimension was operationalized as the feature decisions with regard to the model of refrigerator the respondents would place in their home. The instructions for this section read as follows:

> As we stated earlier, you will now have a chance to consider other combinations of features, and styles of refrigerator-freezers. The four models which you have been evaluating are just a part of the large number of different refrigerator-freezers. And, since the refrigerator-freezer serves such a prominent place in most families, there may be some unique aspects of the refrigerator-freezer that you need in your home that may not have been reflected in the models we gave you.
>
> We are interested in the type of refrigerator-freezer you would design if given the chance. To do this, we are going to present you with a number of alternatives of nine (9) different features. These features are presently available on different models. You will have the freedom to place any feature on any model. We will present the features in a specified order, and you will make a decision on that feature. Along with the alternative, will be the costs associated with that alternative.

The subjects then responded to the features of size, style, color, insulation, defrost, icemaker, shelves, power miser, and cold water dispenser. This set of dependent measures is a crucial test of the impact of energy consumption information. The choice is not between the

models, but related to the features placed on each model. This taps choice in a slightly different manner. As stated earlier, this operationalization of choice allows for a more clear interpretation of impact at the behavioral level. This measurement is also more sensitive to the present state of knowledge of the consumer. At the time of this data collection, there was no concerted effort to sensitize to the consumer purchases to the energy dimension, and also no effort was made within this study. Thus, when confronted with a model using less energy this model may or may not be preferred in light of product benefits. The judgments then of a series of models may not reflect energy consumption impact. The impact at this stage may more subtly be found in the desire for certain attributes for inclusion on a model--not in overall preferences for an existent model. Thus, at this stage of the policy, the energy use disclosure may not change overall preferences for a model, but may be reflected in a lessened demand for energy-related features.

This type of measurement does not preclude model choice evaluation for the choices may be combined to produce a model. Thus, model choices can be compared; in addition, the building task facilitates an analysis of the micro decisions that made up the model choice. The respondents indicated the feature alternative they wanted and then responded to the following question:

> If this alternative were to be temporarily unavailable, how likely is it that you would accept a different (size, style, defrost, etc.) very likely (7); very unlikely (1).

This statement provides an indication of strength of choice. The subjects who would not want another of the alternatives would be unlikely to accept a different alternative due to a temporary unavailability. The rationale for this measure is that the subjects, by indicating their choice on each feature are responding in a dichotomous way (choice/no choice) and this response is not indicative of the strength of the choice. Does the choice of an 18 cubic foot size reflect a decision which the respondent feels is the only decision for her, or are there other acceptable alternatives.

A final behavioral measure is that of a second choice for those features with more than one alternative available.

Analysis of building task.

The building task will be analyzed a number of different ways. The size dimension will be analyzed by a one-way analysis of variance with the treatment conditions pooled. While the size choice is in reality a dichotomous choice, the impact of energy consumption will be reflected in the average size choices. Consequently, an analysis of variance will be used to test for differences between the size choices of those receiving energy consumption data versus the group with energy consumption data. A significant test statistic would indicate a relationship between size choices and energy use disclosures.

The other energy-related dimensions (style, insulation, defrost, icemaker, power miser, and cold water dispenser) will be analyzed using the Z statistic. The style decision will be collapsed into side-by-side/other to yield a 2x2 table. The defrost decision will be handled in a

similar manner collapsing the decision into frost free/non frost free defrost. The computation will yield a test statistic that will be tested for a significant impact of the energy consumption data.

The likelihood measure will be analyzed with a one-way ANOVA. The significant F test will indicate if the likelihood of changing the initial decision is related to energy disclosures. This amounts to a comparison of the likelihood of changing within each choice across the disclosure conditions.

This chapter was designed to discuss the specifics of the research methodology. The discussion presents the rationale of the tasks, and manipulations of this study. Given this background, the following chapter provides the experimental findings which resulted from this research effort.

CHAPTER V
RESULTS

Introduction

The previous chapters have served the purpose of relating the conceptual foundation of this dissertation, and the specifics of the research effort. Chapter V will present the results of the experiment with a discussion of the meaning and limitations of these findings.

The following sections will contain two major topics. The first will be the analysis procedures to be followed. Within this discussion will be the major analytical tools to be used adding any special considerations inherent to this study. The second topic will be the presentation of the results of each hypotheses.

Analysis Procedures

Before delving into the results, this section will present the analytical tools to be employed. The major tests will be run using cross tabulations, tests of a proportion, and one-way analyses of variance.

Cross Tabulation

This study employed extensive use of the cross tabulation procedure within the Statistical Package for the Social Sciences (SPSS) (Nie, et al., 1975). In many cases, the cross tabulations were used to gain insight into the existence of effects of the disclosure conditions. In this manner the Chi square test statistic serves the same

purpose of the parametric F test. The significant Chi square indicates a dependent relationship between the treatment conditions and the dependent measures. Subsequent analyses, such as additional cross tabulations can then be run on subsets of the tables, in a similar manner conceptually to the t-tests, to cull out the location of the significant relationships.

The cross tabulation tables also provide a convenient way to summarize the data. The visual presentation of the data gives a better feel for the relationships under consideration. In some instances, the cross tabulations are characterized by the presence of either low expected values or low cell sizes. Given the instability of the test statistic under these conditions, the categories were combined to meet standard requirements or the results were reported descriptively.

Test of a Proportion

In several of the analyses the presence of a significant Chi square test statistic denoted a lack of total independence in the comparison of two or more variables. Independence in statistical terms has a very specific meaning, and in larger cross tabulation tables it is more likely to find a relationship that is not independent. The problem lies in the fact that with large cross tabulation tables the dependence can occur for a number of reasons. Given that this study employed six treatment conditions it becomes necessary for interpretation and hypothesis testing to be able to substantiate the significant findings. To accomplish this certain disclosure conditions and response categories were combined a priori for comparison purposes. The com-

bining of cells was accomplished in a manner that made sense conceptually, and facilitated more careful impact judgments. The results of this process was in most cases 2 X 2 contingency table. This presentation was superior in that it allowed for less equivocation of the results' interpretation and explanation.

The 2 X 2 contingency allows for a directional test for differences between the disclosures. The test is a test of a proportion. When a frequency distribution has only two categories (i.e., a 2 X 2 table) the Pearson X^2 has exactly the same value as the square of the standardized variable used in making tests of a proportion, a Z statistic (Hays, 1963, p. 586). This test statistic offers the flexibility of testing directional hypotheses. It is the case that this research is hypothesizing directional impacts and the Z statistic allows this type of comparison.

One Way Analysis of Variance

When the dependent measures are intervally scaled, it is acceptable to perform analysis of variance. This design is a completely randomized design with six treatment conditions. Conceptually, what has been done is the selection of six fixed levels of disclosure of energy consumption data. Since one factor is being tested the analysis of variance is one way. Due to the fixed nature of the treatment levels, the subsequent inferences will be limited to the levels present in this study. The computer program to be used is the SPSS subprogram ONEWAY.

In each of the analyses the presence of a significant F value is crucial to subsequent comparisons. This is particularly true given the large number of a posteriori comparisons to be made in this research. The comparisons to be made are all within the bounds of hypothesized relationships, however, the comparisons are large in number and not orthogonal in nature. Consequently, the comparison procedure must carefully control for these factors.

The tests to be run are either Tukey's honestly significant difference (HSD), or Fisher's least significance difference (LSD) (Kirk, 1968). In one instance, Dunnets' multiple comparison procedure was employed (Kirk, 1968). In this instance, the test statistic is converted from the standard t-tests. This method is useful in that it allows for a number of a priori non-orthogonal comparisons.

With regard to the assumptions of the analysis of variance model the assumptions will only be discussed in the cases where violations may endanger the results. For example, in each of analyses the assumption of homogeneous error variances will be tested and if the variances are not equal, this will be reported and the necessary adjustments will be made.

The appropriateness of the analysis will be directly determined by the qualities of the dependent measure and the comparison to be made. When the test involved non-metric data, the cross tabulation or test of a proportion will be employed, while the metric analysis will be analysis of variance.

The next section will present the results of the study. The discussion will be organized around the hypotheses. Each subsection will be supplemented by tables presenting the necessary data and analysis. Also, Appendix K will provide all of the system cards for the analysis performed under each hypothesis, and data listing in another appendix.

Significance Levels

The nature of the problem, which is the focus of this dissertation urges statements about the nature of the results from this experiment. Under normal convention, results would not be considered significant if the alpha level of a given test statistic is not greater than or equal to .05. The essence of this conclusion is that the results can thereby not be given to chance occurrence.

For the most part, this convention will be followed in this study's results. However, the need to represent these data in light of the problem may result in conclusions and implications being made from results which 'approach' significance ($\alpha \leq .10$). In all cases, the significance levels are reported so that the reader may determine the significance of the findings.

Hypothesis One: Impacts of the Disclosure

> The disclosure of energy use data will have a significant impact on the preferences, overall impressions, and energy use expectations of alternative refrigerator-freezer models. Specifically, subjects receiving energy use data will have lower preferences, lower overall impressions, and more accurate expectations of energy use for models which are high users of energy.

The results of this hypothesis were gathered after a brief shopping-like experience where the individual subjects gathered energy consumption data from refrigerator-freezer model displays. Immediately following this exposure, and without the benefit of the information itself, the subjects were asked to recall what they had found out about the models. The subjects responded to three sets of questions concerning the models.

Model preference

The preference for each model was measured by the following statement:

> Rank the models you have just seen in order of preference. Give the model you most prefer a 1, the next model a 2, the third in preference a 3, and the model you least prefer a 4.

The respondents then indicated their personal preference for each model. To determine the broad impact of the energy consumption disclosure, the disclosure conditions were combined and compared to the no energy control condition.

The preferences were transformed to contrast the effect of the disclosure on the respondent's first choice among the alternative models. When looking at the problem associated with the disclosure of energy consumption the subject (consumer) is making decisions which reflect the impact of the disclosure. It is likely then that the model which will be the probable purchase choice, from a group of alternatives, will be the model which the respondents indicate is their highest preference. A critical test is whether or not the first choice of the respondents is affected by energy consumption data.

The model preferences were recoded to be first choice (1) versus other choice levels combined (0).

Table 12 presents the data for all disclosure conditions in terms of the first choices of the respondents. The data is reported for all models.

Table 12
First Choice of the Treatment Conditions by Model

	Control	$/year plus a range	$/year plus a range plus by feature	KWH/year plus a range	$/month plus a range	$/year
MODEL 1 as first choice	0 0.0%	2 9%	2 9%	2 9%	1 5%	0 0%
MODEL 2 as first choice	6 25%	3 13%	4 17%	3 13%	3 13%	3 13%
MODEL 3 as first choice	11 46%	11 44%	8 35%	11 44%	10 45%	11 50%
MODEL 4 as first choice	7 29%	9 36%	10 43%	8 33%	8 36%	8 36%
TOTAL	24	25	23	24	22	22

The important comparisons for this hypothesis are the models which are high energy users, Model 2 (top freezer style with frost free defrost-101.00 per year energy use), and Model 3 (side-by-side style with frost free and an icemaker--96.80 per year energy use). The results of the comparison of choices for Model 2 and Model 3 is presented in Table 13.

Table 13

Preferences for MODEL 2 and MODEL 3

	Control	Combined Treatment	2	P
MODEL 2 as first choice	6 25%	16 14%	1.36	.09
MODEL 3 as first choice	11 46%	51 44%	.13	n.s.

If energy consumption data are to have a successful impact, it should be reflected in lower preferences (i.e,, lower first choice) for high energy use models. As shown in Table 13, the difference in preferences between the control condition and the combined disclosure condition on MODEL 2 approaches significance ($p<.09$). However, the preferences for MODEL 3 indicates no significant difference between the control and disclosure conditions.

The preferences for the models do not seem to be effected unless the energy use for the model under consideration is different (worse) than would be expected. In this case, MODEL 2 is the only model which deviates from the expected energy use by using more energy. Support for the potential impact is seen on MODEL 2 where the percent of subjects preferring this model was lower in the conditions receiving energy use data when compared to the no energy condition. While the difference approached significance, the disclosures conditions were uniformly lower than the no energy condition in terms of preference for this unexpectedly high energy use model.

Overall impressions

It is felt that the limited number of models available for evaluation may place an inordinate burden on the ability of the energy use disclosures to have an impact on preferences. The respondents enter the experimental task with a variety of real world experiences and needs which may govern the preferences among the models. The subsequent impact of the disclosures may not alter these preferences but will be reflected in the impressions of the models. To test the affect of the presence of energy consumption data on the overall impressions of each model, the following statement was used:

> My overall impression of Model (1,2,3,4) is:
> very favorable (7), very unfavorable (1).

The presence of energy use information is expected to impact on the evaluations of each model in a specific manner. For those models with high energy use the respondents who receive the energy use data should evaluate these models less favorably (lower score) than the respondents without energy use data available.

Table 14
Overall Impressions by Model

	Control	Combined Treatment	Difference
Model 1	2.21	2.38	- .17
Model 2	5.54	4.04	1.50
Model 3	5.25	5.68	- .43
Model 4	5.46	5.77	- .31

Note: responses were very favorable (7) to very unfavorable (1).

Again the disclosure conditions were combined to test for the impact of the presence of energy use data. Table 14 provides the mean impressions by model. Again, the important comparison is MODEL 2 and MODEL 3, for these are the models in the set of models to be evaluated which are extreme users of energy.

Table 15 gives the analysis for the overall impressions of MODEL 2. The difference between the disclosure conditions and the control condition is highly significant, and the mean values are in the hypothesized direction. The presence of energy consumption data resulted in lower overall impressions of MODEL 2. The analysis for MODEL 3 proved highly non-significant as would be expected from Table 14.

It should be noted that the overall impressions of MODEL 2, while significantly affected by the energy use data, is still positive. This fact is interpreted as evidence of the realistic manner in which the subjects included the energy use data in this task. Also, it is important to note that the presence of extremely low energy use for a model did not automatically result in lower overall impressions. For example, MODEL 1 (top freezer style with manual defrost) did not possess the features the subjects wanted in refrigerator-freezer, and consequently the low energy use data was not reflected in the impressions. The positive impact of the disclosures appears to rest realistically with the models which are actual choice alternatives for each consumer. And in those cases, the specific impact is on models which are high energy users in terms of what the consumer might reasonably expect.

Table 15
One Way ANOVA on Overall Impressions of MODEL 2

Source	df.	SS	MS	F	F probability
Between Groups	1	44.916	44.916	14.77	.001
Within Groups	141	428.748	3.040		

It is apparent that the differences are centered on the model which is a high energy user (higher than would be expected), MODEL 2. From the mean evaluations of all models, a trend in judgments is becoming characteristic in the control condition. The respondents in the control condition are responding in a manner which is reflective of models which are efficient energy users. In the cases where that assumption is invalid, the model is not efficient, the significant differences are found. In the case where the intuitive judgments are incorrect, the presence of energy use data has a positive impact on overall impressions. The tests concerning the energy use expectations should provide insight into the viability of this assumption with regard to the consumer judgments.

Energy use expectations

The impact of the energy consumption data should be reflected in more accurate expectations of energy consumption for the refrigerator models. The specific impact will center on the models which require more than intuition for accurate energy use rankings. The following question was used to tap energy use expectations:

> Rank the models on the basis of energy use (the highest energy use gets a 1) (the control condition is asked to rank the models on the basis of how much energy they expect the models to use).

If the subjects could correctly anticipate the energy consumption without the disclosure, the need for the energy use labels would be less urgent.

Table 16 presents the results of the judgments on energy use expectations as they relate to the correct (actual energy use) rank for each model.

This set of responses serves a number of purposes. In one sense the pattern of the data indicates that the particular manipulation of energy use data in this study was successful. The use of MODEL 2 as a particularly high energy user (in fact, the highest from among the four models presented) could not be anticipated by the experimental subjects. Thus, from one point of view, the improvements in energy use expectations would be interpreted as a manipulation check. The subjects could not reasonably interpret the model energy use when it is divergent from expectations (particularly to the negative side of the expected value).

To follow this line of reasoning, one must look to see if the ranking closely parallel this expected value ranking. If one were to take the expected value of the model's energy use, the rankings would be as follows: MODEL 3 (side-by-side style with frost free and an icemaker) ranked first, MODEL 4 (top freezerstyle with frost free and an icemaker) ranked second, MODEL 2 (top freezer style with frost free) ranked third, and MODEL 1 (top freezer style with manual defrost) ranked fourth. The judgment as to energy use expectations in relation to this

ranking are as follows: 61 percent ranking MODEL 3 first in energy use; 53 percent ranking MODEL 4 second in energy use; 67 percent ranking MODEL 2 third in energy use; and 80 percent ranking MODEL 1 fourth in energy use.

Thus, the respondents were able to correctly rank the models in terms of the expected value of the energy use approximately 65 percent of the time (as an average across all models). Even taken in light of the expected value of the models, as the consumer might encounter an average performer for each model, the energy use expectation judgments are characterized by a large number of incorrect responses.

Another consideration when interpreting these data is that models presented were real world models. Consequently, the judgments could be required of a consumer facing the model which was the prototype of MODEL 2. The question becomes how then can the results be interpreted? It appears that a consumer facing these same four choices would benefit from the disclosures. As shown in Table 16, the responses for the subjects who received energy use data more closely relates to the rankings of the models use in this task than the no energy subjects.

However, in absolute terms, the performance would have to be judged as poor, particularly for MODELS 2, 3, and 4. A very low percentage of those subjects made the correct ranking in relation to each model's actual energy use. This could be due to the fact that the subjects were not required to access the energy use data on any of the models. However, the judgments of these no-access subjects, although

they did actually receive the treatment in this initial task, must still be assigned to the treatment condition (Campbell and 1963, p. 16). The absolute nature of these judgments may also be attributable to the fact that this followed a one-shot exposure to the data. In any case, the performance must be rated as poor even though differences are found between those subjects with energy data available and those subjects without the benefit of energy use data.

Table 16

Energy Use Expectations by Model

	Conditions				Results	
Model	Control		Combined Treatments		Z	p
MODEL 1*						
Correct	14	73.7%	75	82.4%	1.40	.10
Incorrect	5	26.3%	16	17.6%		
MODEL 2*						
Correct	0	0.0%	12	12.9%	2.19	.02
Incorrect	19	100.0%	81	87.1%		
MODEL 3*						
Correct	4	25.0%	25	26.6%	.016	n.s.
Incorrect	15	75.0%	69	73.4%		
MODEL 4*						
Correct	0	0.0%	14	14.9%	1.89	.03
Incorrect	21	0.0%	80	85.1%		

*Note: the correct response for the models are: MODEL 1 - 4th highest energy use, MODEL 2 - 1st highest energy use, MODEL 3 - 2nd highest energy use, and MODEL 4 - 3rd highest energy use.

General comments

The results of this section must be viewed favorably from the point of view of the goals of the EPCA. The presence of energy use data resulted in different judgments about the four experimental models when compared to a condition without energy use data available.

It is instructive to note that the impact of the disclosures is found for models which are high users of energy, high users in terms of the expected or assumed energy use. The subjects appear to assume a model is a satisfactory performer on the dimension of energy consumption. The impact of the disclosures is found when this assumption is inaccurate. Thus, the potential of the program appears to relate to the situation where intuitive judgments of the consumer do not reflect the actual product performance.

Hypothesis Two: Testing the Provision of the Range

> The disclosure of the relative range of energy consumption values for similar products will provide comparative data which will result in significantly different judgments with regard to the feasibility of additional shopping, the likelihood of finding a better value, and encouraging purchase. Specifically, for MODEL 2, subjects receiving the range of energy consumption values will state that it is more likely that a better value could be found, that it would be worth the effort to engage in additional shopping, and would be more discouraging with regard to purchase when compared to subjects who did not receive the range of values.

As stated in an earlier discussion, the disclosure of the range of comparative values provides information which heretofore has not been explicitly disclosed. The impact of the range of comparative

values has not been empirically verified, particularly with regard to the incremental benefits of this dimension of performance disclosures. To test the impact of the comparative disclosure a set of three questions were asked for each model:

> The likelihood of finding a better value--
> Given that the purchase prices are about the same would you advise your friend that if she shopped around the likelihood she would find a better value for the money from another brand is: very likely (7); very unlikely (1).
>
> Worth the effort to shop elsewhere--
> In this case would you advise your friend that going to other stores to bind a better Model (1,2,3,4) is likely to be: not worth the effort (1); clearly worth the effort (7).
>
> Purchase advice--
> If your friend says that she has decided to buy this brand (the brand you have evaluated) Model (1,2,3,4) would you: strongly encourage (7); strongly discourage (1) her to buy this brand.

The scales have withstood the test for convergent and discriminant validity described in a previous chapter so one can be relatively assured that the impact of the comparative aspect of the disclosure is being measured.

Table 17 presents the mean responses for the judgments for MODEL 2. The actual scales are better value--very likely (7); very unlikely (1); worth effort (7); not worth the effort (1); and purchase--discourage (1); encourage (7). The means are in the hypothesized direction for support of the hypothesis. The comparison is between the conditions which received the comparative disclosure versus those pooled conditions without comparative information.

Table 17

Impact of the Range of Comparative Values for Responses to MODEL 2

Scale	Noncomparative	Combined Comparative Conditions	Difference
Likelihood of finding a better value*	3.71	4.33	+.62
Worth the effort to shop elsewhere*	3.51	4.32	+.81
Purchase advice*	4.75	4.08	-.67

*Note: for the hypothesis to be supported, the response for the scales should be; the treatment group should feel it is more likely to find a better value (higher score), worth the effort to shop (higher score), and discourage purchase (lower score) when compared to the control condition.

The analysis of variance results in Table 18 indicates that the range of comparative values, as it is operationalized in this study, results in significantly different judgments as to the relative performance of a model of refrigerator-freezer that is relatively poor in energy use performance.

Table 19 presents the mean responses to the comparatively efficient models, Models 1,3, and 4. It is apparent that the subjects in the control condition are responding in much the same fashion as the subjects receiving the energy information.

The presence of the comparative disclosures would not improve judgments if the consumer were to evaluate only models which were comparatively good performers with regard to energy use.

Table 18

One Way Analysis of Variance on the Impact of the Range of Comparative Values for Judgments on MODEL 2

Likelihood of finding a better value

Source	df.	SS	MS	F	F probability
Between Groups	1	13.16	13.16	3.52	.059
Within Groups	149	556.70	3.74		

Worth the effort to shop elsewhere

Source	df	SS	MS	F	F probability
Between Groups	1	22.07	22.07	6.01	.015
Within Groups	150	550.61	3.67		

Purchase advice

Source	df.	SS	MS	F	F probability
Between Groups	1	14.91	14.91	5.00	.025
Within Groups	149	445.05	2.99		

Table 19

Impacts of the Range of Comparative Values for Models 1, 3, 4

	Control	Combined Comparative	Significance
MODEL 1 (top freezer style with manual defrost)			
Better Value	3.47	3.42	n.s.
Worth the Effort	3.59	3.41	n.s.
Encourage Purchase	3.90	3.97	n.s.
MODEL 3 (side-by-side style with frost free, icemaker)			
Better Value	3.26	3.95	n.s.
Worth the Effort	3.64	4.07	<.05
Encourage Purchase	4.83	4.64	n.s.
MODEL 4 (top freezer style with frost free, icemaker)			
Better Value	3.22	3.16	n.s.
Worth the Effort	2.43	3.17	n.s.
Encourage Purchase	5.35	5.46	n.s.

The results of the tests for the impact of the comparative disclosures yielded highly significant support for the hypothesized benefits. The benefit is found when the model under evaluation is relatively less efficient than comparable models. These results were consistent across the three dimensions of the impact of the comparative disclosure; likelihood of finding a better value, whether it is worth the effort to shop elsewhere, and the type of purchase advice given. The potential detrimental affect on consumer choices appears to be significantly lessened by the presence of energy consumption disclosures, and particularly under this hypothesis of the impact of the comparative range of energy consumption for similar models.

Hypothesis Three: Evaluation While Disclosure is Present As An Aid to Processing

> The disclosure of energy consumption data will result in accurate perceptions of a product's energy use when the subjects are not required to rely on memory. Subjects will perceive the products with high energy use as less good than those products with low energy use.

The test of this hypothesis rests with the responses to the following statement:

> In my opinion, the energy use of Model (1,2,3,4) is: good (7); bad (1).

The subjects who received energy use data are requested to give an evaluation of the performance of the models on the basis of energy use with the benefit of the model display and relevant information as a reference. The expectations are that the evaluations of the model's energy use will reflect the model performance on that dimension as presented by the disclosure. The major issue concerning this hypothesis

is the confirmation that the consumer is accurately receiving the intended message of the energy disclosures.

The mean responses of the disclosure are conditions presented in Table 20. The direction of the responses are in the hypothesized directions. Those models which use high amounts of energy are evaluated less positively than those models which use lower amounts of energy. The comparisons to be made at this point are between the models rather than between the treatments. MODEL 2 will serve as a comparison point, and the test of significance will be that MODEL 2 is significantly less favorably evaluated than the other models. Since the critical

Table 20

Evaluation of Model Performance on Energy Consumption

	Mean across all Conditions	$/year plus a range plus a by feature	$/year plus a range	KWH/year plus a range	$/month plus a range	$/year
MODEL 1	6.39	6.40	6.38	6.12	6.69	6.38
MODEL 2	2.81	3.36	2.96	2.35	2.44	2.96
MODEL 3	4.36	4.20	5.39	3.73	3.56	4.92
MODEL 4	5.60	5.40	5.92	5.12	5.62	5.92

Note: the responses range from good (7) to bad (1).

comparisons are not orthogonal, the test statistic will be Dunn's multiple comparison procedure. The procedure is acceptable in a limited number of a priori non orthogonal contrasts will be made. An initial t-test run provided the necessary data for the computation of the critical values for Dunn's test. Table 21 displays the analysis of

the model evaluations. All of the comparisons, except two, are significant and supportive of the hypothesis. The two comparisons which do not reach the acceptable significance levels both involve the comparison of MODEL 2 to MODEL 3. The trend within any of the disclosure conditions does not allow viable a posteriori explanations related to the disclosure format. Given that the other comparisons were significant the weight of the evidence is in support of the hypothesis.

An after-the-fact review of the comparisons provides a plausible explanation for the relationship between MODEL 2 and MODEL 3 evaluations. This comparison places the greatest discriminator burden on the disclosures due to the fact that the absolute amount of energy consumption for these two models is quite close ($101.00 for MODEL 2 and $96.80 for MODEL 3). Consequently, the evaluative judgments are closer than the other comparisons within this hypothesis.

Table 21

Dunn's Test for Significant Differences in the Model Energy Use Evaluations

	$/year plus a range plus by feature	$/year plus a range	KWH/year plus a range	$/month plus a range	$/year
calculated critical difference	1.26	1.11	1.22	1.16	1.23
MODEL 2 vs MODEL 1	-3.04*	-3.71*	-3.77*	-4.19*	-3.42*
MODEL 2 vs MODEL 3	- .84	-2.42*	-1.39*	-1.15	-1.96*
MODEL 2 vs MODEL 4	-2.13*	-3.20*	-2.77*	-3.57*	-2.96*

*significant at less than .05.

From the results of the analysis the hypothesis is supported. When the consumer encounters the energy consumption data attached on the product the disclosure facilitates accurate evaluations of the products' performance.

Hypothesis Four

> The presentation of energy use data will have a significant impact on the demand for energy-related features. The exact impact is the disclosures will result in more energy conscious decisions with regard to product/feature decisions. This will be reflected in smaller size choices, less demand for frost-free defrost, less demand for energy-related styles, higher demand for poured insulation, and the power miser, and less demand for icemakers. This result will be found when comparing groups with energy-use data available to the control.

The most common benchmark by which the success of a public policy information program is measured is the ability of the program to result in changed behaviors. This behavioral dimension has typically been measured by shifts in object choices, most commonly brand choice. This hypothesis deals with behavior in terms of feature decisions within a product decision. This type of orientation does not preclude the more common object analyses, but allows for greater precision when determining the impact of information. The investigation is not only into the ability of a disclosure to reduce energy demand (note that the goal is not to sell less refrigerators), but into the impact on those features with the greatest relationship to energy use. If energy use is to impact it will be through the previous tasks performed by subjects. No energy use data is presented in this task. Thus, this represents a stringent test of impact for the disclosures.

To assess the impact of the energy use data the subjects were asked to make a series of choices among refrigerator-freezer features which would ultimately result in the building of a model which the subjects would be willing to pay for and place in their home. The decisions were on nine features, six of which has a relationship to energy consumption.

The energy-related choices to be made included size (16, 17, 18, 19, 20, and 20+ cubic feet), style (side-by-side, top freezer, botton freezer), insulation (regular, poured), defrost (manual, partial, frost free), icemaker (no, yes), and power miser (no, yes). Each subject followed a sequence dictating the order of the decisions. Associated with each feature alternative is the purchase price of that alternative. There was no presentation of energy consumption data in this task. If the energy use is to impact it will be through the exposure in the model evaluations performed in previous tasks.

Table 22 presents a summary of the feature decisions by condition in terms of the absolute choices, and the percentages in parentheses. The individual analyses for this hypothesis will work from this table, however, in most comparisons the test will be between the control condition and the combined disclosure conditions. The results will be reported feature by feature, and the relevant tables will accompany each section.

Size choice

The hypothesis is that the size choices for those groups receiving energy consumption will be significantly smaller than the control condition. The size choices were coded in the following

Table 22

Summary of Feature Choice by Treatment Conditions

	Control		$/year range by feature		$/year range		KWH/year range		$/month range		$/year		Total	
SIZE														
16	1		1		3		1		1		2		9	
17			7		2		1		2		1		13	
18	3		4		6		9		6		9		35	
19	8		5		6		6		6		5		36	
20	10		7		5		6		10		4		42	
20+	4		1		4		2		1		4		16	
STYLE														
side-by-side	9	35%	8	32%	12	48%	12	46%	14	52%	11	46%	66	43%
top freezer	12	46%	14	56%	10	40%	10	38%	12	44%	8	33%	66	43%
bottom freezer	5	19%	3	12%	3	12%	4	15%	1	4%	5	21$	21	14%
INSULATION														
regular	8	31%	14	56%	12	52%	10	38%	12	44%	5	12%	61	40%
poured	18	69%	11	44%	11	48%	16	62%	15	56%	19	79%	90	60%
DEFROST														
manual	1	4%	2	8%	0	0%	1	4%	2	7%	0	0%	6	4%
partial	1	4%	0	0%	5	24%	3	12%	3	11%	3	13%	15	10%
frost free	24	92%	23	92%	21	76%	21	84%	22	82%	21	87%	132	86%
ICEMAKER														
no	19	76%	20	95%	17	68%	18	75%	17	65%	20	83%	111	77%
yes	6	24%	1	5%	8	32%	6	25%	9	35%	4	17%	34	33%
POWER MISER														
no	11	44%	11	44%	11	46%	11	44%	8	32%	2	8%	54	36%
yes	14	56%	14	56%	13	54%	14	56%	17	68%	23	92%	95	64%

manner: 16 cubic feet = 1, 17 cubic feet = 2, 18 cubic feet = 3, 19 cubic feet = 4, 20 cubic feet = 5, and 20+ cubic feet = 6 (note that this may in fact understate the differences since 20+ is 6 or greater). While each choice is dichotomous the average choice of the conditions represents an interval scaled value. Consequently, the data was analyzed by one-way ANOVA. The means and analysis are presented in Table 23.

Table 23
Analysis of the Size Choice

Groups		Means		Standard deviation	
Control		4.462		1.140	
Combined Treatment		3.773		1.353	
Source	**df.**	**SS**	**MS**	**F**	**F Probability**
Between Groups	1	10.232	10.232	5.871	.016
Within Groups	152	264.891	1.743		

The size choices of the combined disclosure conditions are significantly smaller than the size choices of the control condition. The impact of the energy consumption is reflected in smaller size decisions.

The average size choice for the control condition was approximately 19.5 cubic feet, while the combined disclosure conditions average 18.7 cubic feet in size. This result is of considerable importance. The trend toward smaller sizes would, without a doubt, be a major step toward success for the energy disclosure program.

Style choice

The style dimension was combined to reflect the alternatives in light of the impact on energy use. This was facilitated by combining the top and bottom freezer styles for comparison with the side-by-side style. This comparison better represents the style decision in terms of energy consumption as the side-by-side style is the alternative which uses by far the most energy. The hypothesized result was that the presence of energy consumption would result in lower demand for the energy related style, side-by-side.

The style choices did not reflect this impact. There was no significant difference between the style choices of the disclosure conditions and the control condition. Table 24 displays the results of the choices by condition.

Table 24
Presentation of Style Choices

	Control	Combined Treatment
Side-by-Side Style	9 35%	57 45%
Top and Bottom Freezer Style	17 65%	70 55%

$Z = .92$, $p = .36$

The mean values are in the opposite direction for support of the hypothesis but the two tailed significance level indicates the differences are not significant. However, the results of this feature decision do not lend any support of the positive impact of the energy use data.

The hypothesis is not supported in that the style decisions between disclosure and control conditions did not suffer significantly. The presence of the energy consumption data is not reflected in different decisions with regard to style.

Insulation choice

The results of the insulation choice when considering the hypothesis are the most disappointing. The expected result was for the disclosure conditions to choose the energy saving poured insulation a larger percentage of the time than the control condition. Table 25 displays the insulation choices by condition.

Table 25
Presentation of Insulation Choices

	Control	Combined Treatment
Poured Insulation	18 69%	72 58%
Cut Fiber Insulation	8 31%	53 42%

$Z = 1.10$, $p = .28$

The likelihood that the poured insulation choices for the control condition would be less than the treatment condition is not supported by these choice results. The two tailed test for significance does not reach acceptable significance levels.

The results of this decision are not supportive of the positive impact of the energy use data. The treatment conditions uniformly chose the cut fiber insulation more frequently than the poured insulation.

Defrost choice

The defrost choices were recoded to reflect the energy use variability among the defrost alternatives. The comparison to be made is the percentage of subjects choosing non frost free (manual and partial) defrost versus the frost free decisions. Table 26 presents the results of the defrost decisions. Again the disclosure conditions were combined for comparison purposes.

Table 26
Presentation of Defrost Choices

	Control		Combined Treatment	
Frost Free Defrost	24	92%	108	85%
Non Frost Free Defrost*	2	8%	19	15%

*Note: non frost free defrost is the combined choices for manual and partial automatic defrost choices.
$Z = 1.22$, $p < .12$

The crucial question is whether the energy use disclosures result in more frequent choice of the energy saving defrost types, manual, or partial. The mean responses are in the hypothesized direction as the disclosure conditions chose the high energy use frost free defrost less frequently than the control condition. Analysis of this data indicate that the differences do not quite reach acceptable levels of significance ($Z = 1.22$, $p < .12$). A look at the comprehensive Table 22 indicates that the disclosure conditions uniformly choose the non frost free defrost a greater percentage of the time.

Icemaker choice

The next feature decision was the inclusion of an icemaker on the refrigerator-freezer model. The alternative decisions were to include, or not include this feature. The results are presented in Table 27.

Table 27
Presentation of Icemaker Choices

	Control		Combined Treatment			
Icemaker	6	24%	28	23%	34	23%
No Icemaker	19	76%	92	77%	111	77%

$Z = .02$, p = n.s.

The presence of energy consumption data did not have a significant impact on the choices related to the icemaker.

The data clearly indicate that there was little chance of showing a successful impact. While this feature is related to a model's energy use the incremental energy use of this feature is relatively minor (approximately $12.00 each year). This fact had little incremental effect due to the fact that the sample, in general, did not indicate a desire for this feature. In the case where the subjects do not want the feature, the successful impact (given that success is in the same direction) is limited.

The lack of desire for this feature may be due to local problems encountered by the residents of Gainesville, Florida, the site of the data collection.

Regardless of the rationale for the choices, the sample did not desire the icemaker feature, and the presence of energy use data did not alter that decision.

Power miser choice

The power miser decisions were the only potentially unfamiliar decision required of the subjects. The description of the feature was minimal, and the subjects had to rely on the descriptive name to infer the relationship to energy consumption. The choice was to include or not include this feature. The relationship of the power miser choice to the disclosure conditions is presented in Table 28.

Table 28
Presentation of Power Miser Choices

	Control		Combined Treatment			
Power Miser	14	56%	81	65%	95	66%
No Power Miser	11	44%	43	35%	54	36%

$Z = .88$, $p < .19$

The mean values are in the hypothesized direction, the disclosure condition choices of the power miser feature are in the right direction when compared to the control condition. However, this difference did not reach acceptable significance levels.

The character of the combined disclosure conditions is such that the ability to make statements about this feature is limited. The presence of any significance in the comparison is due to an extreme response by the annual dollars condition (see Table 22). The hypothesis receives no support from this set of results.

Total Energy Consumption and Total Purchase Price

The hypothesis received mixed results from the feature decisions taken individually. The goal of the task for the respondents was to build a model of a refrigerator-freezer they would be willing to pay for and place in their home. While the respondents did not see the model in total, it is possible to construct the model from the responses, and view the impact from a total model perspective. Consequently, the choices for each feature were transformed into total energy cost and total purchase cost terms.

The purchase cost transformations were consistent with the price information available to the subjects during the task (see Appendix A, p. 13-15). The energy consumption costs were transformed using the same figures available in the disclosure condition for the model evaluation. The following energy values were used; side-by-side ($10.00, cut fiber insulation ($7.50), size (16 cubic feet - $32.40, 17 cubic feet - $36.40, 18 cubic feet - $40.40, 19 cubic feet - $44.40, 20 cubic feet - $48.40, and 20+ cubic feet - $52.40), frost free defrost ($25.00), icemaker ($7.50), and no power miser ($7.50). The transformation cards are available in Appendix K. The energy use figures which result will be annual dollars of energy consumption.

For the energy program to achieve ultimate success the feature-model decisions must be reflected in lower total energy consumption by the appliances. Table 29 presents the energy consumption mean values for the comparison of the control and disclosure conditions. While the mean values are the hypothesized direction for program success, the

differences do not approach significance, and cannot be taken as encouraging with regard to program objectives.

Table 29

Analysis of Variance for Total Energy Use Between Treatment Conditions

Groups		Mean Values		Standard Deviations	
Control		$81.59		11.91	
Combined Treatment		$79.68		13.78	
Source	df.	SS	MS	F	F Probability
Between Groups	1	79.34	79.34	.436	.517
Within Groups	153	27853.41	182.05		

This result should not carry the full impact of ultimate program success at this time. First, it would be unrealistic to assume that a one-time exposure to energy consumption would result in such a dramatic impact. The total energy use criterion will be a result obtained over time from the totality of program activities, rather than the mere exposure to information. Second, this result indicates the need for the intermediate choice measures to gain insight into the impact of performance information, particularly the energy program at this stage of development.

The data on total energy use of the model decisions do not exhibit significant differences between the disclosure conditions and the control condition without the benefit of the energy use data.

The total purchase price of the model decisions reflect much the same character as the total energy consumption results. While the average purchase price of the disclosure conditions is lower than

the control condition the difference is not significant, as shown in Table 30. Viewed from a total cost perspective, the models built did not differ significantly across conditions.

Table 30

Analysis of Variance for Total Purchase Price Between Treatment Conditions

Groups		Mean Values		Standard Deviations	
Control		$664.83		22.65	
Combined Treatment		$647.94		21.50	
Source	df.	SS	MS	F	F Probability
Between Groups	1	5535.50	5535.50	.350	.56
Within Groups	153	2309637.00	15819.00		

Discussion of the Building Task Results

In the building task, the subjects were to build, through a specifically designed sequence of tasks, a model of a refrigerator-freezer which would satisfy the subject's needs. The choices were evaluated in light of the potential of energy use data to result in a lower energy consumption decision.

The results of the choices yield one significant finding (size choices) and one which approached significance (defrost choices). The other feature decisions relating to energy consumption (style, insulation, icemaker, and power mizer) did not reach acceptable levels of significance.

The decisions were also considered from a total model perspective using both total purchase price and total energy cost per model as criterion. The results of this analysis did not support the hypothesis.

The overall support for the hypothesized impact of energy use data is relatively poor. The disclosures appear to have some influence, but the overall pattern is mixed.

Given the nature of this task, this lack of support is not surprising. The subjects did not have energy use data available in this set of decisions, and were provided with no energy information as feedback after the decisions. This represents then a very stringent test of behavioral impact and even though the data is in general of mixed support, this cannot be taken as conclusive evidence either for or against program success.

Likelihood of Change Measures

A secondary set of questions relating to the feature decisions attempted to tap the likelihood of changing the initial feature choices. After furnishing their initial choices the subjects responded to the following question:

> If this alternative were to be temporarily unavailable, how likely is that you would accept a different (size, style, etc.): very likely (7), very unlikely (1).

The score on this question indicated the respondents' willingness to accept another alternative, measuring the strength of the first choice. The hypothesized relationship is that the impact of the energy consumption would be reflected in a willingness to switch from energy consuming feature alternatives, or an unwillingness to switch from non energy consuming alternatives. Given the lack of significant differences, the energy use data may be reflected in the strength of those decisions.

Table 31 presents the one-way analysis of variance scores for the likelihood of change measures. The change scores did not differ between the control and disclosure conditions along any of the feature decisions. The presence of energy use data is not reflected in the strength of choice.

Table 31

Likelihood of Change by Feature Choice

Feature	Control	Combined Treatment	F	F probability
Style				
Side-by-side	4.00	4.02	.0025	.601
Top and bottom	3.06	2.70	.373	.549
Insulation				
Cut Fiber Glass	5.50	4.67	1.120	.294
Poured	4.17	4.35	.019	.618
Defrost				
Frost Free	2.25	2.34	.035	.659
Manual or Partial	4.50	4.06	.070	.687
Icemaker				
Yes	2.50	2.68	.038	.664
No	3.26	3.02	.168	.660
Power Miser				
Yes	4.21	4.39	.083	.689
No	3.36	3.63	.125	.680

Note: responses range from very likely (7) to very unlikely (1).

General Comments on Hypothesis Four. This hypothesis postulates a positive impact of energy consumption disclosures through the reduction of demand for energy consuming features of a refrigerator-freezer. The choice dimension is the ultimate goal of most standardized performance information programs. In the case of this research, the choice has been operationalized as feature decisions. The hypothesis

received mixed support. The features which account for the greatest amount of model energy use showed some influence of energy use data.

It is interesting to note that this result would not be found if the choice dimension had been viewed from a total energy use perspective (i.e., from the perspective of model choice). The object decisions did not reflect a positive impact of the energy use disclosures.

The secondary measures which were designed to tap the strength of the initial choice were not affected by the presence of energy use data. It would have been instructive to have measured certain subjective states after the feature decisions had been completed. This is one of the impact levels which was not represented in this study, and should be included in future research efforts.

In the first four hypotheses the central issue has been the impact of the energy use data versus a condition which did not have benefit of the disclosure. Given the generally positive results from these hypotheses, the question now becomes which of the disclosure formats is most effective.

Hypothesis Five: Importance of Disclosure Format

> The format of the disclosure of energy-use data will have a significant impact on the success of the program to disclose energy consumption. The disclosure formats will be evaluated with regard to preferences, evaluations, and product choice. Specifically, the disclosure of energy consumption in dollars will have a greater impact than the disclosure in Kilowatt hours. The disclosure of energy use in yearly units will have a greater impact than the disclosure in monthly units. Also, the format disclosing energy use data by feature will provide additional benefits over a condition not providing feature-energy use data.

In the preceding tests, the orientation has been to verify whether the presence of energy consumption data resulted in differential responses to refrigerator-freezer decisions. It was found that the presence of energy use data had a slight positive impact. This result was found by combining the disclosure conditions to compare with the control condition. This transformation has conceptual support in that each treatment condition discloses the same energy consumption data, however each disclosure condition is characterized by different combinations of format variables. This hypothesis is directed toward assessing the relative success of each disclosure condition. The essential questions are the disclosure's performance relative to the control condition, and the performance relative to the required disclosure of the EPCA (annual dollars plus a comparative range).

The structure of the results within this hypothesis will follow the levels of impact discussed in the previous hypotheses.

Relative performance of alternative format for disclosure versus the control condition.

In each of the following sections, essentially the same analyses are performed as in the previous four hypotheses with the exception that the disclosure conditions were not combined, but were singularly compared to the control condition. The results of the comparisons on MODEL 2 preferences and expectations of energy use is presented in Table 32. The table presents the relative performance of the format conditions as reflected in preferences and energy use expectations. The pattern is that none of the formats differ significantly from the control in terms of preferences. The energy use expectations do show

significant differences, with the exception of the $/year plus a range condition.

Table 32

Performance of the Disclosure Alternatives versus the Control Condition on MODEL 2 Preferences and Expectations of Energy Use

	$/year plus a range		$/year plus a range plus by feature		KWH/year plus a range		$/month plus a range		$/year	
	Z	p	Z	p	Z	p	Z	p	Z	p
Preference	1.04	.15	.62	.27	.97	.17	.97	.17	.97	.17
Expectations	1.03	.15	1.74*	.04	1.79*	.04	1.85*	.04	1.81*	.04

*Significance at less than .05.

It should be stated that the interpretation of the energy use expectations is subject to the same controversy as discussed in Hypothesis One.

The results of the one-way ANOVA for overall impressions on MODEL 2 is presented in Table 33. The overall F test indicates that there is at least one of the comparisons that is significantly different. The Fishers LSD test yields two subsets of the conditions which differ from each other at the .05 level. The control condition comprises one subset, while the disclosure conditions comprise the other. Thus, the disclosure conditions each are significantly different from the control, but no significant difference exists between the format alternatives.

In reviewing these initial judgments there is very little to distinguish one disclosure alternative from another in their improve-

Table 33

Performace of the Disclosure Alternatives versus the Control Condition on Overall Impressions of MODEL 2

Source	df	SS	MS	F	F probability
Between Groups	5	44.57	8.92	2.90	.016
Within Groups	137	420.98	3.07		

Fisher's Least Significant Difference, p = .05

Subset 1	$\bar{X}$	Subset 2	$\bar{X}$
$/year plus a range	4.04	control	5.54
$/year plus a range plus by feature	3.92		
$/year	4.00		
KWH/year plus a range	4.16		
$/month plus a range	4.30		

Note: responses range from very favorable (7) to very unfavorable (1).

ment over the control condition. While the overall presence of energy consumption data results in differential responses, this impact is not related to the format of the disclosures. The preferences, evaluations, and expectations indicate a uniform difference between the control condition and each format alternative. Before engaging in a conclusive discussion concerning the format issue, the results of the building task will be presented.

Table 34 presents a summary of the analyses of the impact of the disclosure formats on the feature choices. The significance levels reported reflect the probability that the disclosure choices result in the hypothesized improvement in choices. When the size dimension is analyzed with the disclosure conditions combined there exists a significant difference between the disclosure conditions and the control conditions. However, when the disclosure conditions are analyzed

non-aggregated the disclosure alternatives do not differ significantly from the control condition, or from the other disclosure alternatives. The significant size differences are attributable to the presence of energy use data and not the format by which the data is communicated.

Table 34

Building Task: Performance of the Disclosure Alternatives versus the Control Condition

Size

Source	df.	SS	MS	F	F probability
Between Groups	5	12.59	2.52	1.42	.219
Within Groups	148	262.53	1.77		

Tukeys Multiple Range Test yielded on homogeneous subset

Condition	$\bar{X}$
$/year plus a range	3.77
$/year plus a range plus by feature	3.52
$/year	3.80
KWH/year plus a range	3.84
$/month plus a range	3.93
Control	

Control condition versus:

	$/year plus a range		$/year plus a range plus by feature		KWH/year plus a range		$/month plus a range		$/year	
	Z	p	Z	p	Z	p	Z	p	Z	p
Style	.97	.17	.20	.31	.85	.19	1.00	.16	.81	.21
Insulation	1.52*	.07	1.82*	.04	.82	.21	1.14*	.13	.79	.22
Defrost	1.22	.12	.04	.49	.05	.48	1.23	.11	.57	.28
Power Miser	.00	n.s.	.14	.45	.82	.21	.88	.19	2.90	.00

*The direction of these choices is opposite from the hypothesized relationship.

The choices of the other energy related features are presented in the second half of Table 34. The comparison of the control and disclosure conditions is not significant with regard to the style decisions.

The insulation choices are characterized by a great deal of inconsistency among the disclosure conditions. The disclosures in annual dollars plus a range and annual dollars plus a range plus by feature were significant in the wrong direction, and the monthly dollars plus a range was also characterized by responses in the wrong direction. The control condition chose the energy saving poured insulation significantly more often than the subjects in the treatment conditions.

The defrost decisions are uniform across the disclosure conditions. However, none of the format alternatives performed significantly better than the control condition.

The power miser decisions are characterized by highly nonsignificant comparisons, with the exception of the annual dollars condition. As Table 22 shows, the respondents in this condition choose the power miser in 92 percent of the cases.

The final set of results are associated with the energy consumption and purchase price of the model developed in each condition. The results and analysis by condition are presented in Table 35. Given the results of Hypothesis Four, it is not surprising that no significance exists along either the total energy use or purchase price comparisons. The total lack of significance prevents any distinction among the disclosure conditions.

Table 35

Building Task: Performance of the Disclosure Alternatives versus the Control Condition on Energy Use and Purchase Price

Total Energy Consumption

Source	df	SS	MS	F	F probability
Between Groups	5	314.50	62.90	.339	.556
Within Groups	149	27617.90	185.35		

Tukeys Multiple Range Test yielded one homogeneous subset

	$\bar{X}$
$/year plus a range	$80.09
$/year plus a range plus by feature	79.87
$/year	79.66
KWH/year plus a range	77.29
$/month plus a range	81.42
control	81.59

Total Purchase Price

Source	df	SS	MS	F	F probability
Between Groups	5	64630.50	12926.10	.793	.556
Within Groups		242875.80	16300.39		

Tukeys Multiple Range Test yielded one homogeneous subset

	$\bar{X}$
$/year plus a range	$649.85
$/year plus a range plus by feature	630.76
$/year	682,92
KWH/year plus a range	646.11
$/month plus a range	643.00
control	685.42

In discussing the impact of alternative disclosures two major issues are evident. First, the results obtained from combining the disclosure conditions appears to be empirically, as well as conceptually sound. The results in Hypothesis Four were not due to a uniquely powerful impact of a disclosure format, but to the presence of the

energy data. Secondly, no one alternative appears to be uniformly superior when each is compared to the control condition.

Relative performance of the disclosure conditions versus the EPCA mandate.

At the present time the disclosure of energy consumption disclosure is to be made in terms of annual dollars plus a comparative range. The benefits of the comparative range has been documented in a previous hypothesis. The comparisons to be conducted in this section are addressed to the unit of measurement (KWH vs. dollars), the time period for computation of energy use (monthly vs, yearly), and the incremental benefit of the by feature disclosure. The EPCA requirement, as stated in the act, must stand the test of impact on consumer purchase behavior. This section will use the EPCA as the comparison group in order to test the relative performance of the alternative formats.

From Table 36, it can be seen that the EPCA requirement did not perform significantly better or worse than the alternatives on the initial judgments about MODEL 2. The analysis of the overall impressions in Table 33 also show no differences between the disclosures.

Table 37 presents the analysis for the building tasks on the crucial energy use features. Again, the format alternatives are not significantly different from the EPCA requirement. The feature choices with regard to size (see Table 34), style, insulation, defrost, power miser, total energy use (see Table 35), and total purchase price (see Table 35) do not differ across the disclosure alternatives under study.

Table 36

Performance of the Disclosure Alternative versus the EPCA Requirement on Judgments for MODEL 2

	Annual dollars plus a comparative range versus:					
	$/year plus a range plus by feature		KWH/year plus a range		$/month plus a range	
	Z	p	Z	p	Z	p
Preferences	.4	.49	.09	.47	.05	.48
Expectations of Energy Use	.94	.18	1.12	.14	1.06	.15

Table 37

Building Task: Relative Performance of Disclosure Alternatives versus the EPCA Requirement

	Annual dollars plus a comparative range versus:					
	$/year plus a range plus by feature		KWH/year plus a range		$/month plus a range	
	Z	p	Z	p	Z	p
Style	.87	.20	.15	.46	.01	.50
Insulation	.28	.39	.98	.17	.42	.34
Defrost	1.20	.12	.32	.37	.06	.47
Power Miser	.13	.45	.13	.45	.99	.16

Note: the significance levels are the probability that the EPCA performs significantly better than the format alternative.

In a sense, the conclusions from this section of the hypothesis are frustrating for none of the disclosure alternatives exhibited consistently superior performance in terms of impact. The variables which were hypothesized to create differential impact did not show signif-

icant differences. However, one fact became clear, the disclosure as mandated by the EPCA is not superior in terms of impact. The impact does not appear to be linked to the unit of measurement manipulations or the time period for computing energy use data studied in this experiment.

A final set of measures in this study asked the subjects to evaluate the manner of energy use disclosures, perceptions of feature energy use relationships and respondents' preferences for energy use disclosures.

Respondents' perceptions of feature/energy use relationships

One possible measure of a disclosure alternative's effectiveness is the ability to aid the consumer in identifying the source of the performance of a product. This is particularly crucial for energy consumption in that certain features are critical with regard to energy use. The previous impact measures have attempted to determine the effectiveness of the disclosures by the response to tasks relating to refrigerator-freezer models. This measure explicitly asked the feature/energy use relationship. The respondents were required to match several features with one of the following energy consumption responses:

1. strongly decreases energy use,
2. slightly decreases energy use,
3. does not decrease or increase energy use,
4. slightly increases energy use,
5. strongly increases energy use.

The respondents made these judgments for the frost free, icemaker, poured insulation, side-by-side style, and cold water dispenser features.

The results, which are presented in Table 38, of the responses to this task are of considerable interest. There are no significant differences across the treatment conditions in terms of the perceptions of feature/energy use relationships. Also, the disclosure conditions do not differ from the control condition in terms of these judgments. If this study had centered on the respondents reporting of the feature/energy use relationships, it would have appeared that the disclosures would be of little use. Given the scales in this measure, the presence of energy use data did not improve the subjects' knowledge of the source of energy consumption. However, when exposed to the energy use data, the 'state of knowledge' was reflected in differential responses. This result is supportive of the impact of the energy use disclosures. No significant differences occurred along the judgments of feature/energy use relationships. If this had been the criterion, the general impact of the disclosure would not have been accurately reflected.

The results of this measure are limited by the scale used. The scale only allowed two levels of relationship if the respondent felt the feature was related to energy consumption. If this type of self report measure were to be used subsequently, this scale should be adjusted to accommodate other levels of response.

Table 38

Feature/Energy Use Judgments by Condition

	Control	$/year plus a range	$/year plus a range plus by feature	KWH/year plus a range	$/month plus a range	$/year	F	p
Frost Free	4.08	4.50	3.88	3.96	3.83	3.96	1.44	.21
Icemaker	4.08	4.42	4.12	4.04	3.63	3.74	2.07	.08
Poured Insulation	1.76	2.39	2.60	2.08	2.17	2.14	1.35	.25
Side-by-Side	3.44	3.54	4.00	3.75	3.58	3.67	.84	.53
Cold Water Dispenser	3.96	4.17	4.13	4.08	4.16	3.67	1.17	.33

Note: responses are 1-strongly decreases, 2-slightly decreases, 3-does not effect, 4-slightly increases, 5-strongly increases.

Evaluation of the Disclosure Usefulness and Complexity

Another self-report measure was used to gain further insight into the subjects' perceptions of the energy use information. The following question was asked:

> You have been given a lot of information on the four models of refrigerator-freezers. We would like to know your feelings about that information.
>
> In evaluating the 4 models, the information on: energy use was; useful (7), useless (1), complex (7), simple (1).

In a descriptive sense, these responses should provide insight into the responses under each disclosure. If the disclosure is evaluated lower, this fact would aid in the explanation of a disclosures poor performance.

From Table 39 it can be seen that the evaluation of the disclosures do not differ.

Table 39

Evaluations of the Usefulness and Complexity of the Disclosure Alternatives

	$/year plus a range	$/year plus a range plus by feature	KWH/year plus a range	$/month plus a range	$/year	F	p
Useful*	6.33	6.38	5.91	6.23	6.32	.402	.639
Complex*	3.21	3.54	3.17	3.22	2.57	.309	.503

*Note: responses are useful (7); useless (1); complex (7), simple (1).

The disclosure formats are uniformly evaluated as useful, and viewed neutrally with regard to complexity. Given, the uniform responses to the tasks across disclosures formats, these evaluations are consistent with the disclosure performances.

Respondent Choice for Disclosure Format

The final question of the experimental session asked the respondent to report the manner in which they would like the energy consumption data to be reported. Specifically, the question read:

> If the government required that all brands present the amount of energy that their products used, how would you like for that information to be presented? dollars per month, dollars per year, KWH per month, KWH per year.

Table 40 presents the respondent choices by disclosure condition.

Table 40

Preferences for Disclosure Format

	Control	$/year plus a range	$/year plus a range plus by feature	KWH/year plus a range	$/month plus a range	$/year	Total
$/month	10	7	13	8	14	9	61
$/year	3	2	3	4	4	3	19
KWH/month	4	7	3	6	3	3	26
KWH/year	2	2	1	2	0	0	7
$ and KWH per year*	6	4	1	4	5	3	23
$ and KWH per month*	0	0	0	0	0	0	1

*These categories were created to accommodate subjects who placed more than one preference

Surprisingly, even though none of the respondents correctly knew the rate charged per kilowatt hour in Gainesville, the overwhelming choice for disclosures is dollars and/or KWH per month. The lack of distinction between the performance of the format alternatives lends greater importance to this result. If a format does not differentially impact on responses in this setting, the desire of the subject for future disclosures may prove to enhance the long-term effect of the disclosures.

Discussion

With such a large amount of data, it is instructive to summarize this hypothesis. The expected relationship was for the format of the disclosures to result in differential impact. Specifically, the

dollars unit of measurement and yearly time period for computing energy use was expected to be the superior formats. However, from this study there exists no evidence of differences in performances in the format alternatives under study. The format alternatives were compared to the control condition, and then to the EPCA required disclosure. Consistently across the various dependent measures relating to the evaluations of the model; energy use expectations, preferences, overall impressions, and in the measures relating to feature demand no trends in format performance was evident. The one fact that is clear is that the mandated disclosure format of the EPCA is not superior or inferior to the alternatives in this study. The inherent characteristics of the disclosure alternatives may be the most useful basis for differentiation. The flexibility of the alternatives and the preferences of the consumers would also be useful inputs.

A second set of results showed no difference in the disclosure alternatives in conveying feature/energy use information. In fact the control condition was able to identify the general energy impact of the set of features as well as the disclosure conditions. With regard to the success of the energy use disclosures the self-report measures are of limited usefulness. The fact that differences in responses have been found due to the presence of energy use data is not reflected in the subjects' reporting of feature/energy use relationships.

A third set of measures was reported which asked for the evaluation of the complexity and usefulness of the disclosures. Again the alternatives did not differ in terms of the subjects' perceptions.

A final set of responses provided descriptively the preferences of the subjects with regard to the various disclosure alternatives. This was the final question of the task and indicated a preference for dollars and/or KWH per month. Given the lack of support for the alternatives, in terms of performance, this line of questioning may take on added significance.

This experimental design was not such that definitive statements can be made about the manipulations of the format variables. It will be the role of future factoral designs to conclusively test for the impact of format variables. However, the results of this study tested five relevant disclosure conditions against both the control condition and against the EPCA requirement and found no empirical differences. The hypothesis expecting differences along the format dimensions was not supported.

Hypothesis Six

> The impact of the disclosure of energy consumption will be dependent, upon the characteristics of the individual receiving the energy consumption data. The disclosure of energy consumption will have a greater impact on high-education consumers when compared to low education consumers.

In past policy or policy oriented research, a paradox has become evident with regard to program effectiveness. The groups to which the program is essentially directed exhibit the least potential for successful impact of the disclosures. In a sense, the energy program may not face this problem. The potential for energy savings may be with the higher income, higher education consumer. Due to greater buying power, these consumers are likely to possess more energy-using time-saving

devices. Definitive statements about the respondent characteristics and the potential success cannot be made from this sample, consequently, this set of results are descriptive rather than strictly hypothesis testing. The issue is whether the characteristics of the sample seem to have affected the responses to the disclosures.

On the last two pages of the test instrument, the subjects responded to demographic questions concerning age, education, race, income, respondent occupation, spouse occupation, and number of children.

A series of cross tabulations were conducted to test whether the characteristics of the sample were related to the various dependent measures. The results are shown in Table 41. When viewing this set of results, the table reports the significance levels of each comparison. Should the relationship be dependent further analysis will be conducted to insure adequate cell size and reliability of the test statistic. However, in viewing the results, there exists only a chance number of significant relationships. Consequently, this discussion will proceed descriptively.

The results are consistent with what one would expect in the real world. The number of children in a family was positively related to the size of the model chosen in the building task. The larger the family, the greater the size demands. The size dimension is also related to the income of the family. Those respondents with higher income were more likely to choose larger models of refrigerator-freezer. In order that the treatment assignment did not reflect this

Table 41

The Relationship of Sample Characteristics to the Dependent Measures

	Age	Education	Income	Occupation	Spouse's Occupation	Children
Size	.96	.46	.02*	.47	.57	.06
Defrost	.64	.45	.78	.46	.42	.93
Style	.53	.75	.07*	.67	.82	.81
Insulation	.46	.81	.21	.51	.87	.91
Power Miser	.71	.31	.63	.11	.93	.89
Frequency of Model Acquisition						
MODEL 1	.58	.18	.58	.19	.11	.77
MODEL 2	.73	.81	.47	.78	.72	.82
MODEL 3	.06*	.02*	.89	.10*	.05*	.89
MODEL 4	.49	.38	.70	.99	.18	.40
MODEL 2:						
Better Value	.78	.28	.77	.18	.61	.61
Encourage Purchase	.61	.12	.25	.21	.19	.89
Worth Effort	.39	.49	.49	.68	.79	.62
Expectations Energy Use	.31	.73	.36	.35	.14	.61

*Significant at $p < .10$

income characteristic (i.e., the higher income subjects were in the control condition more than in the disclosure conditions--thus explaining the size differences in a previous hypothesis) a two-way analysis of variance was performed on the size results. The ANOVA tested for a significant treatment-income interaction as well as the main effects

which have become evident, size, and income. The interaction between treatment assignment was highly insignificant ($p = .99$). Thus the income and treatment effects are separate influences on the size choices. The subjects' income was also related to the style decisions with the higher income subjects choosing the side-by-side style more frequently.

The only other set of results which are significant is the acquisition of information on MODEL 3 energy use. The younger, highly educated, professional occupations accessed the information on MODEL 3 energy use more often. The large expense of this model may account for this result. The crucial comparison are the measures relating to MODEL 2. None of these results are to a level which would cast doubt on the results of the previous test of hypotheses.

The race dimension was represented in this study, but due to a problem with the collection of the demographics in this session, the personal data is incomplete. It was possible to test whether the black respondents produced significantly different models in the building task, however, the test showed no significant difference in models. It is worth noting a qualifying judgment at this time. The experimental session for the black respondents was modified to accommodate the severe problems these respondents had with the task in general. The ability to read and respond to this task was questionable. Consequently, a larger proportion of the black subjects did not complete the questionnaires, or did not complete the task in a usable form. The statements which can be made with regard to the race dimension are limited, and will be left to further research efforts.

Discussion of the Findings

Essentially, this research has been directed toward two major problems; will the disclosure of energy consumption data result in positive changes in consumer purchase related behaviors, and does the format of this disclosure relate impact?

The focus of the research has consistently been on the program to disclose energy consumption data on labels attached to major home appliances. Given this focus a carefully designed experiment with a representative sample was conducted. The dependent measures were chosen to reflect the various levels of impact expected of the disclosure, and were particularly sensitive to the early stage of program development.

To assess the impact of the energy use disclosures, the respondents were given two major tasks. First, the respondents gathered information from displays of 4 models of refrigerator-freezer. After gathering the information as they would in a brief shopping exposure, the respondents were asked a series of questions concerning the models; rank preference, overall impressions, and energy use expectations. These responses were accomplished by recalling the information. Following the first set of questions, the subjects encountered the models again, and using the information as reference gave evaluations of the models and made comparative judgments for each model.

The crucial set of judgments centered on a poor energy use model--MODEL 2. Also, MODEL 2 was designed in such a way that the tradeoffs with the other model in terms of sources of energy use could be accomplished.

The second task was a choice task whereby the subjects indicated their preferences of features to include on their own refrigerator-freezer model. This set of measures addresses the choice impact of energy use disclosures in a fashion which could tap subtle changes in behavior.

The results of the study indicates that the presence of energy consumption data does have an impact on purchase-related decisions. From Hypothesis One, it was shown that the presence of energy use data resulted in significantly lower preferences and lower overall evaluations for the MODEL 2 judgments. Without the energy use data, the subjects appear to be making incorrect inferences about model energy use, and when the energy use data is available, the responses are effected. This is further supported by the improved accuracy of energy use expectations for the disclosure conditions. When the intuitive judgments of the subjects were not reflected in the model performance on energy consumption the judgments were consistently improved by the disclosures. This set of findings is very supportive of the potential impact of the energy use data. After a one-time shopping exposure to energy consumption data, there exists solid evidence that the presence of the data has a positive impact on consumer decisions.

The comparative energy use disclosures produced improved judgments for the models under evaluation. The presence of energy consumption alone does not give the consumers an accurate indication of the relative performance of a product. Consequently, the comparative judgments are improved by this disclosure. Thus, Hypothesis Two

received consistent support.

Of interest to the energy program is insight gained from the first two hypotheses about the general orientation of the subjects. It appears that the impact centers exclusively on models which are poor performers on energy. The respondents appear to make the assumption that the model is a good performer on energy use. This is reflected in the fact that the responses to models which were satisfactory performers on energy showed no difference between control and disclosure conditions. It is only when the model's energy use is counter to this assumption that the impact of information is felt. In a broad sense, the presence of this orientation by the consumers would provide support for the disclosure.

From the first set of tasks, a consistent orientation to evaluation by the subjects became evident. Without the benefit of the energy use data, the subjects were responding to an object in a manner which would have indicated that the model was a good performer with regard to energy use. When the model was not a good performer, the judgments were not reflective of the performance for the group which did not have the benefit of the disclosure. The energy use data resulted in significantly different judgments, and these differences were centered on the model which was a high energy user.

In the situation where the consumer is faced with performance data, a crucial, but uninvestigated question, is whether the information intended is actually being perceived (i.e., when the product is a poor performer do the judgments consistently reflect this fact). If the presence of the performance information results in correct

decision, it is assumed that the information is correctly perceived and used. Under Hypothesis Three, the evaluations of the respondents showed that the energy use data resulted in correct judgments as to the models' energy use. This is more than a trivial issue. In many of the program evaluations the negative results have been attributed to the lack of impact of the information, rather than the quality of the information. An alternative hypothesis would be that the information perceived was not consistent with the intent of the disclosure. In the case of the results of the energy use data's impact reported in this study, the perceptions related to energy use reflect the information disclosure.

The common bellweather of a program's ultimate impact is the changes which result in behavior. For the program mandating the energy disclosure, the ultimate goal impact is the reduction in the demand for energy using products. This research undertook a different approach to the choice decision. The common approach has been to request object choice, particularly brand choice. The choice decision for this study centered on the feature choices relating to the subjects' own refrigerator-freezer needs. The task was such that the result of the feature decisions is the construction of a refrigerator model. The results of the analysis of the feature decisions alone indicated a potential for the disclosures in light of the program goals.

When the feature decisions were converted into model decisions the positive impact of the energy use data was no longer evident.

The fourth hypothesis dealt with an extensive analysis of the performance of the format alternatives present in the study. The

particular manipulations were the unit of measurement (dollars vs. KWH), the time period for computing energy use (monthly vs. yearly), and the incremental benefit of the by-feature disclosures. The evidence does not indicate advantages of any of the format alternatives. It was clearly evident that the annual dollars plus a comparative range (the EPCA requirement) was not superior to the other formats.

Given that the disclosures did not result in clear impact differences, the preferences for a format by the subjects becomes relevant. In a survey type question, the subjects indicated preferences for dollars and/or KWH per month as the desired disclosure. However, the subjects did not view the different formats as different in terms of usefulness and complexity.

A further set of results is worth discussion. A secondary set of questions on the feature-energy use relationship was presented following the building task. The disclosure conditions did not result in superior judgments or different judgments as to the relationship of certain features and energy consumption. It was not necessary to disclose energy consumption for the subjects to know generally the source of a model's energy use. However, when the energy consumption became relevant, as in the experimental tasks, differential responses resulted. If this study had focused on self-report measures, rather than the experimental responses, the energy use data would not have been accurately represented with regard to impact.

In general, the results of the test under each hypothesis provides a consistent positive picture of the potential impact of the

energy consumptions disclosures. Differences at each level were significant and consistent with the goal of the program. However, this study, like any research endeavor, is subject to certain limitations.

Limitations of the Study

First, the task is characterized by a one-sitting exposure to the energy use data. This does not give insight to the impact over time, given that the program will be augmented by a series of related educational activities.

Secondly, the acquisition task, while lending realism, did present problems in administration of the sessions. An acquisition task was not necessary given the thrust of this research. An initial exposure to the displays could have accomplished the same purpose, but would have been a less realistic task from an initial model evaluation standpoint.

Third, certain additional measures and changes in current scales would have offered improvement. The measurement of the subjects' subjective states would have been instructive following the building task. Also, the scale used in the feature/energy use statements should be expanded to include additional levels of response.

Fourth, the sample cannot be taken as representative of the larger consuming population. The limited geographical area, character of the demographics of the sample limit external generalizing capabilities. The sample was composed of relevant individuals, housewives, so that the comparisons between the groups is enhanced. The character of

the sample would have been enhanced by the inclusion in a more standard manner of certain minority groups, and a broader spectrum of income levels.

Fifth, while the product class of refrigerator-freezers is representative of the major home appliances, the positive impact of the disclosures must be replicated over other product classes.

Sixth, the design of this study does not allow for definitive statements with regard to the format variables manipulations. It would seem that the manipulation of certain format variables should be related to disclosure impact. While differences were not found across the formats studied, the lack of differences cannot be unequivocally be attributed to the format variables. The format decision deserves further investigation.

This chapter has presented the results of the research effort centered on the impact of energy use disclosures. The results indicated consistently positive responses attributed to the presence of energy use data. The format alternatives under study were very similar in performance, and warrant further investigation.

The following chapter concludes this dissertation by presenting the implications of the findings.

CHAPTER VI
CONCLUSIONS

Introduction

This final chapter is designed to synthesize the previous discussion in light of the implications to be drawn from this dissertation. The following sections will deal with the contributions made through the results and the process of obtaining the results, and the implications for future research.

The Findings

The research addressed two fundamental questions of impact for the program to provide energy consumption on major household appliances. The issues were the ability of the energy disclosures to aid the consumer in shopping activities, and the relationship of the format of the disclosures to the impact.

The data was gathered from a sample of 155 housewives in Gainesville, Florida during a two week period in July, 1976. The respondents were paid participants from eight local womens' organizations. The task was, first, to evaluate a set of four models of refrigerator-freezer manufactured by the same brand (however, the brand name was withheld). This evaluation took the form of an acquisition task with initial responses based on the information gathered, and a second set of evaluations of the same four models with the information available for reference. The final task was a feature by feature choice of a

model designed by the respondent to use in their home. The task was complex, as is the task of evaluating and choosing a refrigerator-freezer. The dependent measures taken were then used to test for certain hypothesized relationships.

Hypothesis One. The impact of the energy consumption data clearly and significantly effected the preferences, overall impressions, and expectations of energy use of the respondents. Those receiving the information had significantly lower preferences and overall impressions of a model which was a high energy user. Also the respondents were unable to accurately rank the models on the basis of energy use when the energy use information was not present or if the intuition of the respondent was not consistent with the experimental model's energy use. The impact was centered on the models which were high energy users in relation to expectation, which supports both the impact and intentions of the disclosure.

Hypothesis Two. The presence of the comparative range produced dramatic differences in comparative evaluative judgments. The model which was a relatively poor performer on energy use was evaluated significantly less favorably by the disclosure conditions which disclosed the comparative information. This result was found across three dimensions of the impact of the comparative disclosure.

It became apparent after the first two hypotheses that the respondents were operating under the assumption that the models were good performers in terms of energy use. When this assumption was

supported by the actual performance the judgments of the disclosure conditions and the control condition were very similar. However, when the assumption of good performance was incorrect the evaluations of the disclosure conditions were significantly improved. If the consumer were to evaluate all models which were low energy users, both absolutely and relatively, the disclosures would offer little help. But, when the models under consideration vary in performance on the energy use dimension the potential for the disclosures to aid the consumer becomes evident.

Hypothesis Three. In the face of the disclosures the subjects were able to reflect the performance, in terms of energy use, in model evaluations. This is an issue which could have been an alternative hypothesis for the lack of impact of the disclosure.

The impact can be stated to be reflecting the information intended by the disclosures. This hypothesis did not attempt to make statement about the importance of the energy use dimension, but addressed the impact of the disclosure in terms of evaluative beliefs about the models.

Hypothesis Four. A crucial level of evaluation of a disclosure program is the behavior that results from the information. The object decisions of the respondents in this study (total energy use of the model developed), showed no differences between the disclosure and control conditions. However, when the model decision was broken down into the original feature decisions the disclosure conditions exhibited mixed

results. The feature choices which accounted for the greatest per model energy consumption, size and defrost, were effected by energy use data.

It was surprising to find a trace of a behavioral impact. The study was designed to disguise the role of energy use as the focus of the study, and in the building task no energy use data was available. The impact was carried over from the model evaluations of the earlier tasks.

The first four hypotheses dealt with the impact of the presence of energy consumption data. The results, across the levels of impact, were supportive of the hypothesized benefits of the disclosure.

Hypothesis Five. The second major issue is that of the format of the disclosure, and the relationship of the format to the impact of the disclosure. This section tested each disclosure condition against the control condition, and secondly, against the EPCA required disclosure.

The first comparison viewed the performance of each format in terms of the benefits of the disclosure over the current environment with no energy information available. The disclosures performed uniformly in these comparisons. The benefits over the control condition appeared to characterize each disclosure condition. The findings did not portray the EPCA required disclosure as superior to the other conditions. The second set of comparisons strengthened this latter conclusion. There was virtually no difference between the disclosure condition in terms of consumer response.

Also, the measure requesting the self report of the perceptions of feature energy use relationships was characterized by no differences across conditions, either control or disclosure. Consequently, the subjects self-report measures did not accurately represent the responses related to the energy use information. If this study had relied on self report impact the effects of the disclosures would have been misrepresented.

Given the lack of difference in performance the preferences of the respondents for certain formats becomes useful. The choice of this sample was for disclosure in monthly dollars and/or KWH.

Hypothesis Six. This hypothesis provided descriptive results showing the characteristics of the subjects reflected in the responses within the tasks. Income was found to be positively related to size and style choices. The number of children was found to be positively related to the size choices. The acquisition of the side-by-side model energy use data was negatively related to age, related to the occupation (professional occupations acquired this data more often), and positively related to education.

None of the relationships found would negate the positive findings of the previous hypotheses.

The pattern of the relationship of the characteristics to the choices is potentially positive information with regard to impact. Those consumers choosing the energy-related features are those consumers which have exhibited the greatest response to past information

programs, the high income, high educated consumer. This result is made with qualifications due to the nature of the sample under study, but can be taken as an implication for future efforts.

The findings of this experimental study indicate very strongly that the disclosure of energy consumption will have an impact on consumer purchase related behaviors toward major home appliances. This impact is in line with the goals of the disclosures, and was not dependent upon the formats represented in this study.

The Process

This study is important for the process which characterized the investigation, for it is the process which allowed for the rather clear picture of impact evident in the test of hypotheses. The decisions that were made regarding the methodology reflected the fact that the focus of this work was the program activity itself, the energy program was not simply a research vehicle.

The nature of the data collection and the experimental tasks were decisions instrumental to the results. The use of a controlled experiment provided the basis for the cause-effect statements about impact. In addition the experiment allowed for the impact to be in terms of a response to, rather than a report of, the energy consumption disclosures. If the study had relied on the self-report measures, the usefulness of the findings would have been handicapped. The self-report measures which were used did not reflect the impact of the disclosures.

The study benefited from in-depth focus group interviews with the members of the population which would compose the sample to be used. This activity had useful information about the terminology used in relation to the product class of refrigerator-freezers, and aided in the attribute selection for the experimental stimuli.

The task itself was carefully designed to place the subjects in a situation where evaluations and judgments would reflect the interaction of the information with product decisions. The display of information was an abstraction, but the realism of the attendant tasks kept the artificial nature of the displays from being exaggerated. The information itself was representative of the models encountered in the market place, without allowing the outside influences such as brand name, store, etc. to contaminate the results.

The series of tasks allowed for the measurement of several levels of impact which provided a more complete profile of the effect of energy consumption disclosures.

The sample drawn was relevant to the experimental situation and the energy program in general. The housewives represented a knowledgeable group with regard to both the product class and the decisions to be made. Also the respondents were potential consumers which could rightfully be expected to encounter and be influenced by the disclosures.

The process of the dissertation drew also from both the recommendations and limitations found in the literature. By considering the problem under investigation at each stage of the experimental process the results attained are useful both to the researcher and the policy maker.

Implications

The energy use disclosures should have an impact on consumer purchase related behaviors toward refrigerator freezers. This result is consistent across the levels of impact which were represented in this study.

The various formats present in this study did not result in differential responses. It became apparent, however, that the disclosure as required by the EPCA was not the best format in terms of impact. There exists other formats which offer equally good performance, but differ in light of the formats' flexibility and desire of the consumer.

Future Research

One of the major results of this study is that the impact of the energy use disclosures must be documented over a stream of research activities, each addressing important research questions.

The ability and potential of the disclosure must be verified across other product decisions, and in other situations. While the refrigerator-freezer product class is important other product decisions are highly correlated to household energy use. Consequently, the success of the disclosure along other product lines must be documented.

The impact of the energy use disclosures must be broadened. It may be that the disclosures result in a redistribution of energy use within a household, thus showing significant trends within a product class, and very little impact in terms of household energy consumption.

This is the crucial impact of the program which could be lost in the micro-information processing experiments.

The impact of the information in the presence of other powerful information must be investigated. The brand name was held constant in this study and could have an impact on the energy use disclosures. The issue really is the importance of the energy use data among other dimensions. For the disclosures to reach the full potential the consumer must look to the energy use data to discriminate the alternative products. Factors which would enhance the importance of the energy use data should be given research consideration.

The issue of reporting formats needs to be investigated more carefully. The formats under study were carefully considered in light of the policy, but the design employed was deficient in terms of identifying main effects of the independent variable manipulations. The results indicated that the disclosure formats under study did not produce different results. However, these formats were composed of different levels of format variables to which statements deserve to be made.

A second question is the impact of the formats. From the literature the suggestion has been that the impact should be reflected in the information processing variables. However, it may be that the format impact is long term in nature, and that the differential response is evident over time. This may place the format question in a motivational framework, and emphasis less the information processing interactions.

The final aspect is that the program to disclose the energy use data must be made the focus of the research. In this way the quality of the inputs to the policy will be enhanced without sacrificing research standards.

Conclusion

This dissertation attempted to address two major issues relating to the disclosure of energy use data.

It was found that, in this study, the formats under investigation performed uniformly across the various levels of impact. Further, the presence of energy consumption data significantly and consistently improved the responses in a manner supportive of the goals of the disclosure.

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APPENDIX A

QUESTIONNAIRE

PART I

INTRODUCTION

You are about to participate in a consumer behavior study concerned with a major home appliance-refrigerator freezers.

This research is sponsored through the Center for Consumer Research at the University of Florida. We are market researchers interested in consumer decisions with regard to refrigerator freezers, particularly in consumer decisions on features and models of refrigerators. You have been asked to participate in this study because of your experience, and your opinions will be very helpful to us.

This study will consist of two parts. After each part you will be asked a series of questions relating to what you have seen.

Before beginning the study we would like to ask you two questions. When instructed turn the page for question 1.

We are interested in a wide range of questions so some of you may get a different version of the study than others. We are interested in your opinions from the information you receive, since we want opinions there is no right or wrong answer to any question.

It may be that in the course of the study some of you may have a question concerning the material. In order that the others in the group are not disturbed, quietly raise your hand and your question will be answered personally.

If you were in the market for a refrigerator freezer there probably are several characteristics of any model which you would want to examine. These are the characteristics that you would take particular care to gain information about. These are also the characteristics which you, as a consumer, are concerned with and would spend time on when evaluating a model of refrigerator freezer.

In the space below we would like you to list those characteristics of a refrigerator freezer you consider important when you are shopping for a refrigerator freezer.

STOP, DO NOT CONTINUE UNTIL INSTRUCTED TO DO SO

In the first question we asked you to think about the characteristics of a refrigerator freezer that you care about and would spend time on when you, as a consumer evaluate a refrigerator freezer.

In the space below we have listed a number of characteristics of a refrigerator freezer. We would like you to go through this list and indicate the degree of concern you would have with each of these characteristics. To do this you will use the type of ruler which is pictured just above the list of characteristics. As you can see one end of the ruler is marked "NOT IMPORTANT", and is numbered 1. The other end of the ruler is marked "EXTREMELY IMPORTANT", and is numbered 10. Your degree of concern with each characteristic is done by giving us a number between 1 and 10.

Since we are interested in your personal opinion there is no right or wrong answer. Please work quickly through the list.

1 2 3 4 5 6 7 8 9 10

NOT AT ALL IMPORTANT TO ME — EXTREMELY IMPORTANT TO ME

_____COLOR

_____SIZE OF THE FREEZER

_____SIZE OF THE FRESH FOOD SPACE

_____WARRANTY

_____AVAILABILITY OF CREDIT

_____PRICE

_____COLD WATER DISPENSER

_____ENERGY USE

_____AUTOMATIC ICEMAKER

_____TYPE OF DEFROST

_____QUALITY

_____SERVICE COSTS

_____EXPECTED LIFE OF THE PRODUCT

_____TYPE OF INSULATION

_____SHELVE TYPE

_____MAINTENANCE AGREEMENT

_____APPEARANCE

_____LOCATION OF THE FREEZER

STOP DO NOT CONTINUE UNTIL INSTRUCTED TO DO SO.

For the next two parts of this study we would like for you to imagine that you are in the role of a consumer who is looking for a new refrigerator freezer.

We have chosen four(4) models of refrigerator freezers for you to examine. These four models represent the models which account for the greatest number of sales in the past three years. The models are standard models which you could see in a local store selling refrigerator freezers. Each of the models is manufactured by the same manufacturer and sold under the same brand name. All of the models operate on 115 volt electrical current, all have a standard 1 year warranty on all parts and 5 year warranty on the refrigerated system, and all models have the option for the purchase of a maintenance agreement. The store which sells the brand has a service department with a good reputation locally.

We are not able to tell you the brand that makes these models. But we have arranged to provide you with the following information. Also, we have provided a description of the kind of information available.

PRICE-The information presented here is the manufacturers recommended list price. While the price has been known to vary with different dealers the prices shown are also the prices you would have to pay should you decide to purchase any of the models today. Also, the dealer who sells this brand has a credit program which employs standard terms of payment.

STYLE-The style of the refrigerator is represented by the location of the freezer. We have three styles of refrigerator; top-freezer, side by side, and bottom freezer. Each of these styles has distinct advantages and disadvantages which can be explained to you by the dealer should you not be familiar with the styles. Each of the styles will vary in cost.

ENERGY USE-The energy use of each model is expressed in dollars of energy used each year . This figure is arrived at by testing each product under the same conditions. In addition to how much energy is used each year , there is a range of energy use for all brands producing models with the same features. The smallest number is the brand using the least amount of energy, and the largest number is the brand using the most energy for models with the same features.

FROST FREE-In this feature the information will tell you if the model has frost free defrost. If it does not have a frost free defrost the model will have a manual defrost. If the model has a frost free defrost the information will tell you how much the frost free adds to the price and adds to the energy use.

ICEMAKER-The information here will tell you if the model has an automatic icemaker. The icemaker has an automatic cutoff and will fit any of our standard models. Also, if the model has an icemaker the information will tell you how much the icemaker adds to the price and adds to the energy use.

SIZE-The size of the refrigerator freezer models is expressed in cubic feet. This is a standard measure which is a box with 12 inches in length, height, and width. The size tells you how many of these cubic feet will fit into the refrigerated space. Three sizes will be presented in the information. These sizes are the size of the freezer, the size of the fresh food space, and the total size of the model.

INSULATION-The insulation is designed to keep the refrigerated space from being affected by drastic changes in temperature or humidity in the room, or from losing cold air from the refrigerator. There are two types of insulation. The cut fiber glass insulation is standard. The poured insulation is the deluxe type. If the modelhas poured insulation the information will tell you how much this will add to the price and adds to the energy use.

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ENERGY USE-The energy use of each model is expressed in dollars of energy used each month. This figure is arrived at by testing each product under the same conditions. In addition to how much energy is used each month, there is a range of energy use for all brands producing models with the same features. The smallest number is the brand using the least amount of energy, and the largest number is the brand using the most energy for models with the same features.

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SIZE-The size of the refrigerator freezer models is expressed in cubic feet. This is a standard measure which is a box with 12 inches in length, height, and width. The size tells you how many of these cubic feet will fit into the refrigerated space. Three sizes will be presented in the information. These sizes are the size of the freezer, the size of the fresh food space, and the total size of the model.

INSULATION-The insulation is designed to keep the refrigerated space from being affected by drastic changes in temperature or humidity in the room, or from losing cold air from the refrigerator. There are two types of insulation. The cut fiber glass insulation is standard. The poured insulation is the deluxe type. If the model has poured insulation the information will tell you how much this will add to the price

The information on any of these characteristics is the same information you would find on a label on the door of each model. While you are presently limited to these features and information in a later task you will have more freedom to consider other models should you desire.

Your first task will be to gather information on the models. The information is located under tabs attached to the face of a display. Each model will have its own display. Should you want to know the information on any model for any feature you would go to the display for that model, pull the tab for that feature, read the information on the tab, and then place the tab face down on a piece of cardboard which has tape to hold the tab. You can gather information on any model, in any order, and as often as you would like. We are going to ask you some questions after you have gotten the information that you want. Try to remember the information as you would were you to be seriously considering the models.

The models and cardboard with the tape are located in envelope 1. You will have 8 minutes to gather your information. Please open envelope 1, remove the models and cardboard, and begin to evaluate the models.

STOP DO NOT CONTINUE UNTIL INSTRUCTED TO DO SO

Rank the models you have seen in order of preference. Give the model that you prefer most a 1, the next model a 2, the third in preference a 3, and the one you least prefer a 4.

____MODEL 1 ____ MODEL 2 ____ MODEL 3 ____ MODEL 4

INSTRUCTION

In the next question and in many of the following questions we want to determine how you feel about the models, or features of the models.

In answering these questions make your response on the basis of how you personally feel.

Here is how to use the scales to answer the questions.
If you feel that the models or features are very closely related to one end of the scale you should place your mark as follows:

high ____:____:____:____:____:____:__X__ low

or

high __X__:____:____:____:____:____:____ low

If you feel that the model or feature is quite closely related to one end of the scale(but not extremely), place your mark as follows:

good ____:____:____:____:____:__X__:____ bad

or

good ____:__X__:____:____:____:____:____ bad

If the models or features seem only slightly related to one end of the scale (but not really neutral), place your mark as follows:

similar___:____:____:____:__X__:____:____ different

or

similar___:____:__X__:____:____:____:____ different

The direction toward which you mark depends on which of the two ends of the scale seems most characteristic of the model or feature you are judging. If you consider the model to be neutral or unrelated to the either end of the scale place your mark as follows:

good ____:____:____:__X__:____:____:____ bad

Check every scale, and only check one place on each scale. There is no right or wrong answer.

My overall impression of MODEL 1 is:

very favorable ____:____:____:____:____:____:____ very unfavorable
+3 +2 +1 0 -1 -2 -3

MODEL 2 is:

very favorable ____:____:____:____:____:____:____ very unfavorable
+3 +2 +1 0 -1 -2 -3

MODEL 3 is:

very favorable ____:____:____:____:____:____:____ very unfavorable
+3 +2 +1 0 -1 -2 -2

MODEL 4 is:

very favorable ____:____:____:____:____:____:____ very unfavorable
+3 +2 +1 0 -1 -2 -3

STOP DO NOT CONTINUE UNTIL INSTRUCTED TO DO SO.

INSTRUCTIONS

The following statements ask you to rank the models on some features. If you feel that a model is first in rank give it a 1, the next model in rank a 2, the third model in rank a 3, and the lowest in rank a 4. Some of the models may seem to be the same on a feature. If this happens give the models that appear to be the same the same rank (for example give both models a 2) and then give the next ranked model the next rank(for example after giving two models a 2 give the next model a 3).

Rank the models on the basis of original purchase price(the highest purchase price gets a 1):

_____MODEL 1 _____MODEL 2 _____MODEL 3 _____MODEL 4

How difficult was it to rank the models on purchase price:

very difficult ____:____:____:____:____:____:____ very easy
-3 -2 -1 0 +1 +2 +3

Rank the models on the basis energy use(the highest energy use gets a 1):

_____MODEL 1 _____MODEL 2 _____MODEL 3 _____MODEL 4

How difficult was it to rank the models on energy use:

very difficult ____:____:____:____:____:____:____ very easy
-3 -2 -1 0 +1 +2 +3

Rank the models on the basis of size(the largest gets a 1):

_____MODEL 1 _____MODEL 2 _____MODEL 3 _____MODEL 4

How difficult was it to rank the models on size:

very difficult ____:____:____:____:____:____:____ very easy
-3 -2 -1 0 +1 +2 +3

Rank the models on the basis of the number of features they offered (the model with the greatest number of features gets a 1):

_____MODEL 1 _____MODEL 2 _____MODEL 3 _____MODEL 4

How difficult was it to rank the models on the number of features they offered:

very difficult ____:____:____:____:____:____:____ very easy
-3 -2 -1 0 +1 +2 +3

STOP DO NOT CONTINUE UNTIL INSTRUCTED TO DO SO

PART II

We realize that in Part I you did not get very long to look at the models. So that you do not have to remember all of the information we have a copy of the information you had originally. For the last part of the study if you need to, you can refer to these models when answering the questions. The models are located in envelope #2.

The next set of questions will help us to further determine how you feel about the models. You should now begin to answer the questions in Part II.

In my opinion the purchase price of Model 1 is:

good ___:___:___:___:___:___:___ bad
+3 +2 +1 0 -1 -2 -3

size of Model 1 is:

good ___:___:___:___:___:___:___ bad
+3 +2 +1 0 -1 -2 -3

style of Model 1 is:

good ___:___:___:___:___:___:___ bad
+3 +2 +1 0 -1 -2 -3

features of Model 1 are:

good ___:___:___:___:___:___:___ bad
+3 +2 +1 0 -1 -2 -3

In my opinion the purchase price of Model 2 is:

good ___:___:___:___:___:___:___ bad
+3 +2 +1 0 -1 -2 -3

size of Model 2 is:

good ___:___:___:___:___:___:___ bad
+3 +2 +1 0 -1 -2 -3

stlye of Model 2 is:

good ___:___:___:___:___:___:___ bad
+3 +2 +1 0 -1 -2 -3

features of Model 2 are:

good ___:___:___:___:___:___:___ bad
+3 +2 +1 0 -1 -2 -3

In my opinion the purchase price of Model 3 is:

good ___:___:___:___:___:___:___ bad
+3 +2 +1 0 -1 -2 -3

size of Model 3 is:

good ___:___:___:___:___:___:___ bad
+3 +2 +1 0 -1 -2 -3

style of Model 3 is:

good ___:___:___:___:___:___:___ bad
+3 +2 +1 0 -1 -2 -3

features of Model 3 are:

good ___:___:___:___:___:___:___ bad
+3 +2 +1 0 -1 -2 -3

CONTINUE ON THE NEXT PAGE

In my opinion the purchase price of Model 1 is;

good ____:____:____:____:____:____:____ bad
+3 +2 +1 0 -1 -2 -3

size of Model 1 is:

good ____:____:____:____:____:____:____ bad
+3 +2 +1 0 -1 -2 -3

energy use of Model 1 is:

good ____:____:____:____:____:____:____ bad
+3 +2 +1 0 -1 -2 -3

style of Model 1 is:

good ____:____:____:____:____:____:____ bad
+3 +2 +1 0 -1 -2 -3

features of Model 1 are:

good ____:____:____:____:____:____:____ bad
+3 +2 +1 0 -1 -2 -3

In my opinion the purchase price of Model 2 is:

good ____:____:____:____:____:____:____ bad
+3 +2 +1 0 -1 -2 -3

size of Model 2 is:

good ____:____:____:____:____:____:____ bad
+3 +2 +1 0 -1 -2 -3

energy use of Model 2 is:

good ____:____:____:____:____:____:____ bad
+3 +2 +1 0 -1 -2 -3

style of Model 2 is

good ____:____:____:____:____:____:____ bad
+3 +2 +1 0 -1 -2 -3

features of Model 2 are:

good ____:____:____:____:____:____:____ bad
+3 +2 +1 0 -1 -2 -3

In my opinion the purchase price of Model 3 is:

good ____:____:____:____:____:____:____ bad
+3 +2 +1 0 -1 -2 -3

size of Model 3 is:

good ____:____:____:____:____:____:____ bad
+3 +2 +1 0 -1 -2 -3

energy use of Model 3 is:

good ____:____:____:____:____:____:____ bad
+3 +2 +1 0 -1 -2 -3

style of Model 3 is:

good ____:____:____:____:____:____:____ bad
+3 +2 +1 0 -1 -2 -3

features of model 3 are:

good ____:____:____:____:____:____:____ bad
+3 +2 +1 0 -1 -2 -3

CONTINUE ON NEXT PAGE

In my opinion the purchase price of Model 4 is:

good ___:___:___:___:___:___:___ bad
+3 +2 +1 0 -1 -2 -3

size of Model 4 is:

good ___:___:___:___:___:___:___ bad
+3 +2 +1 0 -1 -2 -3

style of Model 4 is:

good ___:___:___:___:___:___:___ bad
+3 +2 +1 0 -1 -2 -3

features of Model 4 are:

good ___:___:___:___:___:___:___ bad
+3 +2 +1 0 -1 -2 -3

CONTINUE ON TO THE NEXT PAGE

In my opinion the

purchase price of Model 4 is:

good ___:___:___:___:___:___:___ bad
+3 +2 +1 0 -1 -2 -3

size of Model 4 is:

good ___:___:___:___:___:___:___ bad
+3 +2 +1 0 -1 -2 -3

energy use of Model 4 is:

good ___:___:___:___:___:___:___ bad
+3 +2 +1 0 -1 -2 -3

style of Model 4 is:

good ___:___:___:___:___:___:___ bad
+3 +2 +1 0 -1 -2 -3

features of Model 4 are:

good ___:___:___:___:___:___:___ bad
+3 +2 +1 0 -1 -2 -3

STOP DO NOT CONTINUE UNTIL INSTRUCTED TO DO SO.

Now that you have carefully investigated the 4 models, you are capable of giving 'expert' advice on what each model has to offer. Let's assume that you are faced with the following situation.

A good friend is in the market for a refrigerator freezer and is looking among name brands, one of which is the brand which produces the models you have been looking at. Your friend needs to buy a new refrigerator very soon. She has sold her old one when she sold her home, and her new home does not have a refrigerator with it. Your friend has hurriedly called the major appliance dealers and found out that she is too late for the sales. Since she cannot get a 'deal' your friend knows that the purchase prices are about the same for the brands she is looking at. Your friend does not have the time to shop so she is calling her friends who know alot about refrigerator freezer for advice. Since you know about the 4 models produced by this brand your friend is calling you. One of the models your friend wants is the same as the models you have just evaluated. In order to give your advice you can use the information on the models.

---

let's say that your friend wants a model that is the same as MODEL 1:

Given that the purchase prices are about the same would you advise your friend that if she shopped around the likelihood that she would find a better value for the money from another brand is:

very likely ____:____:____:____:____:____:____ very unlikely
+3 +2 +1 0 -1 -2 -3

In this case would you advise your friend that going to other stores to find a better Model 1 is likely to be:

not worth the effort ____:____:____:____:____:____:____ clearly worth the effort
-3 -2 -1 0 +1 +2 +3

If your friend says that she has decided to buy this brand's (the brand you have evaluated) Model 1 would you:

strongly encourage ____:____:____:____:____:____:____ strongly discourage her to buy this brand.
+3 +2 +1 0 -1 -2 -3

Now let's say that you friend wants a model that is the same as MODEL 2;

Given that the purchase prices are about the same would you advise your friend that if she shopped around the likelihood that she would find a better value for the money from another brand is:

very likely ____:____:____:____:____:____:____ very unlikely
+3 +2 +1 0 -1 -2 -3

In this case would you advise your friend that going to other stores to find a better Model 2 is likely to be:

not worth the effort ____:____:____:____:____:____:____ clearly worth the effort
-3 -2 -1 0 +1 +2 +3

If your friend says that she has decided to buy this brand's (the brand you have evalusted) Model 2 would you:

strongly encourage ____:____:____:____:____:____:____ strongly discourage her to buy this brand.
+3 +2 +1 0 -1 -2 -3

CONTINUE ON THE NEXT PAGE

Now assume that the model that your friend wants is the same as MODEL 3:

Given that the purchase prices are about the same would you advise your friend that if she shopped around the likelihood that she would find a better value for the money from another brand is:

very likely ___:___:___:___:___:___:___ very unlikely
+3 +2 +1 0 -1 -2 -3

In this case would you advise your friend that going to other stores to find a better Model 3 is likely to be:

not worth the effort ___:___:___:___:___:___:___ clearly worth the effort
-3 -2 -1 0 +1 +2 +3

If your friend says that she has decided to buy this brand's (the brand you have evaluated) Model 3 would you:

strongly encourage ___:___:___:___:___:___:___ strongly discourage her to buy this brand.
+3 +2 +1 0 -1 -2 -3

If your friend tells you that she wants a model that is the same as MODEL 4:

Given that the purchase prices are about the same would you advise your friend that if she shopped around the likelihood that she would find a better value for the money from another brand is:

very likely ___:___:___:___:___:___:___ very unlikely
+3 +2 +1 0 -1 -2 -3

In this case would you advise your friend that going to other stores to find a better Model 4 is likely to be:

not worth the effort ___:___:___:___:___:___:___ clearly worth the effort
-3 -2 -1 0 +1 +2 +3

If your friend says that she has decided to buy this brand's (the brand you have evaluated) Model 4 would you:

strongly encourage ___:___:___:___:___:___:___ strongly discourage her to buy this brand.
+3 +2 +1 0 -1 -2 -3

You have now advised your friend on 4 models of refrigerator freezer produced by the same brand. Your friend now asks if there are any particular reasons for the advise you have given. Using your own words briefly tell the reasons for your advise in the space below.

You have been given a lot of information on the four models of refrigerator freezers. We would like to know your feelings about that information.

In evaluating the 4 models the information on:

total size was:

useful _____:_____:_____:_____:_____:_____:_____ useless
+3 +2 +1 0 -1 -2 -3

complex _____:_____:_____:_____:_____:_____:_____ simple
+3 +2 +1 0 -1 -2 -3

frost free was:

useful _____:_____:_____:_____:_____:_____:_____ useless
+3 +2 +1 0 -1 -2 -3

complex _____:_____:_____:_____:_____:_____:_____ simple
+3 +2 +1 0 -1 -2 -3

icemakers was:

useful _____:_____:_____:_____:_____:_____:_____ useless
+3 +2 +1 0 -1 -2 -3

complex _____:_____:_____:_____:_____:_____:_____ simple
+3 +2 +1 0 -1 -2 -3

insulation was:

useful _____:_____:_____:_____:_____:_____:_____ useless
+3 +2 +1 0 -1 -2 -3

complex _____:_____:_____:_____:_____:_____:_____ simple
+3 +2 +1 0 -1 -2 -3

STOP DO NOT CONTINUE UNTIL INSTRUCTED TO DO SO

You have been given a lot of information on the four models of refrigerator freezers. We would like to know your feelings about that information.

In evaluating the 4 models the information on:

total size was:

useful ___:___:___:___:___:___:___ useless
+3 +2 +1 0 -1 -2 -3

complex ___:___:___:___:___:___:___ simple
+3 +2 +1 0 -1 -2 -3

frost free was:

useful ___:___:___:___:___:___:___ useless
+3 +2 +1 0 -1 -2 -3

complex ___:___:___:___:___:___:___ simple
+3 +2 +1 0 -1 -2 -3

energy use was:

useful ___:___:___:___:___:___:___ useless
+3 +2 +1 0 -1 -2 -3

complex ___:___:___:___:___:___:___ simple
+3 +2 +1 0 -1 -2 -3

icemakers was:

useful ___:___:___:___:___:___:___ useless
+3 +2 +1 0 -1 -2 -3

complex ___:___:___:___:___:___:___ simple
+3 +2 +1 0 -1 -2 -3

insulation was:

useful ___:___:___:___:___:___:___ useless
+3 +2 +1 0 -1 -2 -3

complex ___:___:___:___:___:___:___ simple
+3 +2 +1 0 -1 -2 -3

STOP DO NOT CONTINUE UNTIL INSTRUCTED TO DO SO

INSTRUCTIONS

As we stated earlier you will now have a chance to consider other combinations of features, and styles of refrigerator freezers. The four models which you have been evaluating are just a part of the large number of different refrigerator freezers. An since the refrigerator freezer serves such a prominent place in most families there may be some unique aspects of the refrigerator freezer that you need in your home that may not have been reflected in the models we gave you.

We are interested in the type of refrigerator freezer you would design if given the chance. To do this we are going to present to you a number of alternatives of nine(9) different features of a refrigerator freezer. These features are presently available on different models. You will have the freedom to place any feature on any model. We will present the features in a specified order and you will make a decision on that feature. Along with the alternative will be the costs associated with that alternative.

Your decision on each feature will be placed on a blank next to the name of the feature immediately following the list of alternatives for that particular feature. After your decision you will be asked a question concerning your willingness to accept another of the alternatives should the one you have chosen be unavailable.

Along with each alternative associated with a features is the basic price of the alternative. Also, we have provided space on the far left hand side should you want to keep track of any of the information. The features are in the order that we would like for you to consider them. You will have a chance to change a decision if, looking back on all of your decisions, you feel that any of your decisions does not reflect what you want in a refrigerator freezer.

Remember, take each decision in order, place the letter of your decision on the blank next to the feature name, and answer the question on the willingness to accept another alternative.

---

1. The first decision that you should make is the TOTAL SIZE of the refrigerator freezer. You will have six(6) choices of size all expressed in cubic feet. Along with each size is the basic price for that size with only standard features.

   a. 16 cubic feet-$315.00
   b. 17 cubic feet-$340.00
   c. 18 cubic feet-$365.00
   d. 19 cubic feet-$390.00
   e. 20 cubic feet-$415.00
   f. larger than 20 cubic feet-$440.00 and higher.

   Place your decision in the following space.

   _____TOTAL SIZE

   If this alternative were to be temporarily unavailable how likely is it that you would accept a different size:

   very likely ____:____:____:____:____:____:____ very unlikely
   +3 +2 +1 0 -1 -2 -3

   My second choice on size is_____.

CONTINUE ON TO THE NEXT PAGE

—

2. The next decision is what STYLE of refrigerator freezer you would like on your refrigerator. For this feature we have three alternatives. Your choice is from among the following:

   a. side by side style-adds $90.00 to the price.
   b. top freezer style-standard.
   c. bottom freezer style-adds $40.00 to the price.

   Place your decision in the following space.

   _____STYLE

   If this alternative were to be temporarily inavailable how likely is it that you would accept a different style:

   very likely ___:___:___:___:___:___:___: very unlikely
   +3 +2 +1 0 -1 -2 -3

   My second choice on style is_____.

3. For your third decision you have the choice of what color you would like. You have two alternatives. White is standard and you can have any color for additional costs.

   a. White-standard.
   b. Colors-adds $10.00 to the price.

   Place your decision in the following space.

   _____COLOR

   If this alternative were to be temporarily unavailable how likely is it that you would accept a different color:

   very likely ___:___:___:___:___:___:___: very unlikely
   +3 +2 +1 0 -1 -2 -3

4. Now that you have chosen size, style and color your next decision is the type of INSULATION to place in your refrigerator freezer. There are two types of insulation available.

   a. cut fiber glass-standard.
   b. poured insulation-adds $20.00 to the price.

   Place your decision in the following space.

   _____INSULATION

   If this alternative were to be temporarily unavailable how likely is it that you would accept a different insulation:

   very likely ___:___:___:___:___:___:___: very unlikely
   +3 +2 +1 0 -1 -2 -3

5. You should now decide on the type of DEFROST system you want in your refrigerator freezer. We have 3 types which can be put into any model.

   a. Manual Defrost-standard.
   b. Partial Automatic Defrost- adds $30.00 to the price.
   c. Frost Free Defrost-adds $100.00 to the price.

   Place your decision in the following space.

   _____DEFROST

   If this alternative were to be temporarily unavailable how likely is it that you would accept a different defrost:

   very likely ___:___:___:___:___:___:___: very unlikely
   +3 +2 +1 0 -1 -2 -3

   My second choice on defrost is_____.

CONTINUE ON THE NEXT PAGE

6. With any of the models you have the choice of having an automatic ICEMAKER. Your next decision is whether or not you want an icemaker in your refrigerator freezer.

a. No.
b. Yes. An icemaker adds $75.00 to the price.

Place your decision in the following space.

_____ICEMAKER

If this alternative were to be temporarily unavailable how likely is it that you would accept a different alternative:

very likely ___:___:___:___:___:___:___ very unlikely
+3 +2 +1 0 -1 -2 -3

7. Also available are three different kinds of SHELVES. The different kinds are:

a. Stationary wire shelves-standard.
b. Adjustable wire shelves-adds $20.00 to the price.
c. Stationary glass shelves-adds $30.00 to the price.

Place your answer in the following space.

_____SHELVES

If this alternative were to be temporarily unavailable how likely is it that you would accept a different shelf:

very likely ___:___:___:___:___:___:___ very unlikely
+3 +2 +1 0 -1 -2 -3

My second choice on shelves is_____.

8. A new option available is the POWER MISER package to save electricity. Your next decision is whether you want this option.

a. No.
b. Yes. The power miser option add $60.00 to the price.

Place your answer in the following space.

_____POWER MISER

If this alternative were to be temporarily unavailable how likely is it that you would accept a different alternative:

very likely ___:___:___:___:___:___:___ very unlikely
+3 +2 +1 0 -1 -2 -3

9. The final decision is whether or not you want a COLD WATER DISPENSER on your refrigerator freezer.

a. No.
b. Yes. Cold water dispenser adds $75.00 to the price.

Place your decision in the following space.

_____COLD WATER DISPENSER

If this alternative were to be temporarily unavailable how likely is it that you would accept a different alternative:

very likely ___:___:___:___:___:___:___ very unlikely
+3 +2 +1 0 -1 -2 -3

CONTINUE ON THE NEXT PAGE

Now that you have designed your own refrigerator freezer you may or may not feel that there are some changes you would like to make. If so, you may change any of your original decisions in the spaces below next to the name of the feature you would like to change. Do not change the original answer by marking out the original answer. If you do not want to change any answers leave this section blank.

____TOTAL SIZE

____STYLE

____COLOR

____INSULATION

____DEFROST

____ICEMAKER

____SHELVES

____POWER MISER

____COLD WATER DISPENSER

CONTINUE ON THE NEXT PAGE.

Now that you have considered and used different features in designing your own refrigerator freezer we want to know your opinions about the characteristics of the different features. On the right hand side of the page we have listed five characteristics of a feature, and under each characteristic are statements indicating different degrees which that characteristic could be associated with a feature. You should look at the five features on the left hand side of the page and decide which of the different statements about each characteristic most represents your opinion. When you have made your decision put the number of the statement in the appropriate blank under each feature.

FEATURE

Frost Free

___purchase price

___convenience

___energy use

___reliability

Icemaker

___purchase price

___convenience

___energy use

___reliability

Foured Insulation

___purchase price

___convenience

___energy use

___reliability

Side by Side Style

___purchase price

___convenience

___energy use

___reliability

Cold Water Dispenser

___purchase price

___convenience

___energy use

___reliability

CONTINUE ON THE NEXT PAGE

CHARACTERISTIC

Purchase Price

1. strongly decreases purchase price.
2. slightly decreases purchase price.
3. does not decrease or increase purchase price.
4. slightly increases purchase price.
5. strongly increases purchase price.

Convenience

1. strongly decreases convenience.
2. slightly decreases convenience.
3. does not decrease or increase convenience.
4. slightly increases convenience.
5. strongly increases convenience.

Energy Use

1. strongly decreases energy use.
2. slightly decreases energy use.
3. does not decrease or increase energy use.
4. slightly increases energy use.
5. strongly increases energy use.

Reliability

1. strongly decreases reliability.
2. slightly decreases reliability.
3. does not decrease or increase reliability.
4. slightly increases reliability.
5. strongly increases reliability.

How likely is is that you will buy a new refrigerator freezer in the next year:
very very
likely____:_____:____:____:____:____:____unlikely

Please furnish the following information.

AGE_____ .

SEX: male_____, female_____.

RACE_____.

EDUCATION :

_____some high school

_____completed high school

_____some college

_____completed college

OCCUPATION_____.

SPOUSE'S OCCUPATION_____.

FAMILY INCOME :

_____$0 $4,999

_____ 5,000- 9,999

_____ 10,000- 14,999

_____ 15,000- 19,999

_____ 20,000 or above

WHEN DID YOU LAST PURCHASE A REFRIGERATOR FREEZER:

_____less than 1 year ago

_____1 to 3 years ago

_____4 to 6 years ago

_____7 or more years ago.

WHAT MAKE OF REFRIGERATOR DO YOU PRESENTLY OWN_____.DON'T REMEMBER_____.

DOES YOUR PRESENT REFRIGERATOR FREEZER HAVE THE FOLLOWING FEATURES:

Yes No

_____:_____SIDE BY SIDE
_____:_____TOP FREEZER
_____:_____FROST FREE
_____:_____ICEMAKER
_____:_____POURED INSULATION
_____:_____COLDWATER DISPENSER.

Do you know the how much you pay for each Kilowatt hour in Gainesville_____: _____.
Yes No

If yes, how much do you pay for each Kilowatt hour_____.

If the government required that all brands presented the amount of energy that their products used how would you like for that information to be presented?

_____dollars per month

_____dollars per year

_____Kilowatt hours(or the energy equivalent) per month

_____Kilowatt hours(or the energy equivalent) per year

THANK YOU FOR YOUR COOPERATION. THE RESULTS OF THIS STUDY WILL BE AVAILABLE TO YOU.

APPENDIX B

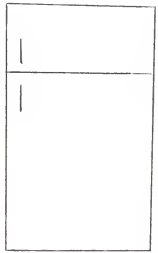
MODEL DISPLAYS FOR THE CONTROL CONDITION

MODEL 1

TOP FREEZER STYLE WITH MANUAL DEFROST

PRICE

$359.00



SIZE

17 cubic feet
13 fresh food
4 freezer

FROST FREE

No

ICEMAKER

No

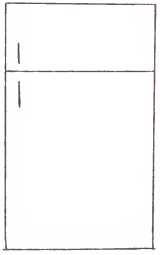
INSULATION

Poured Insualtion-
adds $20 to the price

MODEL 2
TOP FREEZER STYLE WITH FROST FREE DEFROST

PRICE

$439.00



SIZE

17 cubic feet
13 fresh food
4 freezer

FROST FREE

Yes
Frost Free adds $100
to the price

ICEMAKER

No

INSULATION

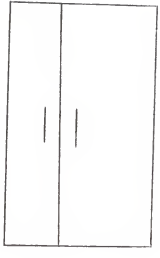
Cut Fiber Glass-
standard

MODEL 3

SIDE BY SIDE STYLE WITH FROST FREE DEFROST AND ICEMAKER

PRICE

$669.00



SIZE

19 cubic feet
13 fresh food
6 freezer

FROST FREE

Yes
Frost Free adds $100
to the price

ICEMAKER

Yes
Icemaker adds $75
to the price

INSULATION

Cut Fiber Glass-
standard

MODEL 4

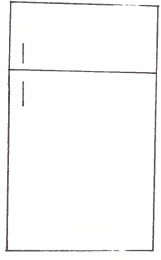
TOP FREEZER STYLE WITH FROST FREE DEFROST AND ICEMAKER

PRICE

$589.00

SIZE

20 cubic feet
15 fresh food
5 freezer



FROST FREE

Yes
Frost Free adds $100
to the price

ICEMAKER

Yes
Icemaker adds $75
to the price

INSULATION

Cut Fiber Glass-
standard

APPENDIX C

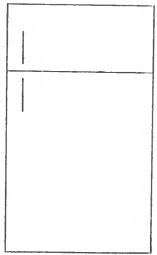
MODEL DISPLAYS FOR THE ANNUAL DOLLARS PLUS A COMPARATIVE RANGE CONDITION

MODEL 1

TOP FREEZER STYLE WITH MANUAL DEFROST

PRICE

$359.00



SIZE

17 cubic feet
13 fresh food
4 freezer

FROST FREE

No

ENERGY USE

$32.40 each year
similar models use
$32.40 to $50.80 each year

INSULATION

Poured Insulation-
adds $20 to the price

ICEMAKER

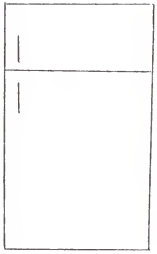
No

MODEL 2

TOP FREEZER STYLE WITH FROST FREE DEFROST

PRICE

$439.00



SIZE

17 cubic feet
13 fresh food
4 freezer

FROST FREE

Yes
Frost Free adds $100
to the price

ENERGY USE

$101.00 each year
similar models use
$60.00 to $108.00 each year

INSULATION

Cut Fiber Glass-
standard

ICEMAKER

No

MODEL 3

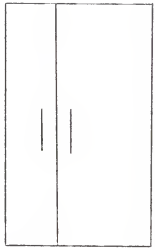
SIDE BY SIDE STYLE WITH FROST FREE DEFROST AND ICEMAKER

PRICE

$669.00

SIZE

19 cubic feet
13 fresh food
6 freezer



FROST FREE

Yes

Frost Free adds $100
to the price

ENERGY USE

$96.80 each year
similar models use
$93.70 to $168.60 each year

INSULATION

Cut Fiber Glass-
standard

ICEMAKER

Yes

Icemaker adds $75
to the price

MODEL 4

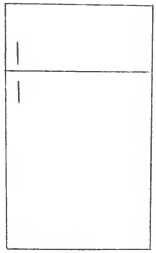
TOP FREEZER STYLE WITH FROST FREE DEFROST AND ICEMAKER

PRICE

$589.00

SIZE

20 cubic feet
15 fresh food
4 freezer



FROST FREE

Yes
Frost Free adds $100
to the price

ENERGY USE

$76.80 each year
similar models use
$75.00 to $135.90 each year

INSULATION

Cut Fiber Glass-
standard

ICEMAKER

Yes
Icemaker adds $75
to the price

APPENDIX D

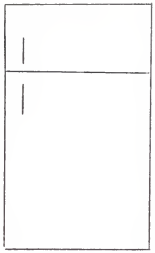
MODEL DISPLAYS FOR THE ANNUAL DOLLARS PLUS A COMPARATIVE RANGE PLUS ANNUAL DOLLARS BY FEATURE CONDITION

MODEL 1

TOP FREEZER STYLE WITH MANUAL DEFROST

PRICE

$359.00



SIZE

17 cubic feet
13 fresh food
4 freezer

FROST FREE

No

ENERGY USE

$32.40 each year
similar models use
$32.40 to $50.80 each year

INSULATION

Poured Insulation-
adds $20 to the price
and subtracts $7.50
each year from the
energy use

ICEMAKER

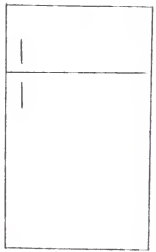
No

MODEL 2

TOP FREEZER STYLE WITH FROST FREE DEFROST

PRICE

$439.00



SIZE

17 cubic feet
13 fresh food
4 freezer

FROST FREE

Yes
Frost Free adds $100 to the price and adds $25 each year to the energy use

ENERGY USE

$101.00 each year
similar models use
$60.00 to $108.00 each year

INSULATION

Cut Fiber Glass-standard

ICEMAKER

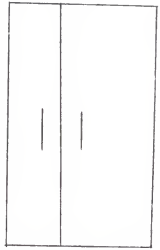
No

MODEL 3

SIDE BY SIDE STYLE WITH FROST FREE DEFROST AND ICEMAKER

PRICE

$669.00



SIZE

19 cubic feet
13 fresh food
6 freezer

FROST FREE

Yes
Frost Free adds $100 to the price and adds $25 each year to the energy use

ENERGY USE

$96.80 each year
similar models use
$93.70 to $168.60 each year

INSULATION

Cut Fiber Glass-standard

ICEMAKER

Yes

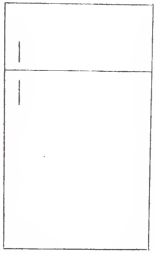
Icemaker adds $75 to the price and adds $12 each year to the energy use

MODEL 4

TOP FREEZER STYLE WITH FROST FREE DEFROST AND ICEMAKER

PRICE

$589.00



SIZE

20 cubic feet
15 fresh food
5 freezer

FROST FREE

Yes
Frost Free adds $100 to the price and adds $25 each year to the energy use

ENERGY USE

$76.80 each year
similar models use
$75.00 to $135.90 each year

INSULATION

Cut Fiber Glass-standard

ICEMAKER

Yes
Icemaker adds $75 to the price and adds $12 each year to the energy use

APPENDIX E

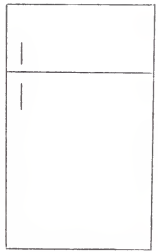
MODEL DISPLAYS FOR THE KWH PER YEAR PLUS A COMPARATIVE RANGE CONDITION

MODEL 1

TOP FREEZER STYLE WITH MANUAL DEFROST

PRICE

$359.00



SIZE

17 cubic feet
13 fresh food
4 freezer

FROST FREE

No

ENERGY USE

648 KWH each year
similar models use
648 to 1016 KWH each year

INSULATION

Poured insulation-
adds $20 to the price

ICEMAKER

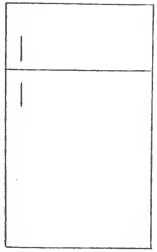
No

MODEL 2

TOP FREEZER STYLE WITH FROST FREE DEFROST

PRICE

$439.00



SIZE

17 cubic feet
13 fresh food
4 freezer

FROST FREE

Yes
Frost Free adds $100
to the price

ENERGY USE

2020 KWH each year
similar models use
1200 to 2160 KWH each year

INSULATION

Cut Fiber Glass-
standard

ICEMAKER

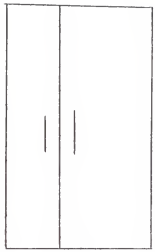
No

MODEL 3

SIDE BY SIDE STYLE WITH FROST FREE DEFROST AND ICEMAKER

PRICE

$669.00



SIZE

19 cubic feet
13 fresh food
6 freezer

FROST FREE

Yes
Frost Free adds $100
to the price

ENERGY USE

1956 KWH each year
similar models use
1874 to 3372 KWH each year

INSULATION

Cut Fiber Glass-
standard

ICEMAKER

Yes
Icemaker adds $75
to the price

MODEL 4

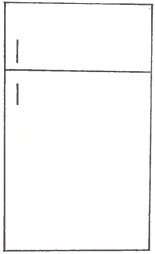
TOP FREEZER STYLE WITH FROST FREE DEFROST AND ICEMAKER

PRICE

$589.00

SIZE

20 cubic feet
15 fresh food
5 freezer



FROST FREE

Yes
Frost Free adds $100
to the price

ENERGY USE

1572 KWH each year
similar models use
1500 to 2178 KWH each year

INSULATION

Cut Fiber Glass-
standard

ICEMAKER

Yes
Icemaker adds $75
to the price

APPENDIX F

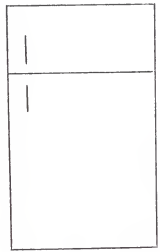
MODEL DISPLAYS FOR THE MONTHLY DOLLARS PLUS A COMPARATIVE RANGE CONDITION

MODEL 1

TOP FREEZER STYLE WITH MANUAL DEFROST

PRICE

$359.00



SIZE

17 cubic feet
13 fresh food
4 freezer

FROST FREE

No

ENERGY USE

$2.20 each month
similar models use
$2.20 to $4.23 each month

INSULATION

Poured Insulation-
adds $20 to the price

ICEMAKER

No

MODEL 2

TOP FREEZER STYLE WITH FROST FREE DEFROST

PRICE

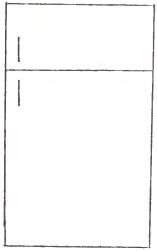
$439.00

FROST FREE

Yes
Frost Free adds $100
to the price

INSULATION

Cut Fiber Glass-
standard



SIZE

17 cubic feet
13 fresh food
4 freezer

ENERGY USE

$8.42 each month
similar models use
$5.00 to $9.00 each month

ICEMAKER

No

MODEL 3

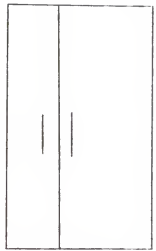
SIDE BY SIDE STYLE WITH FROST FREE DEFROST AND ICEMAKER

PRICE

$669.00

SIZE

19 cubic feet
13 fresh food
6 freezer



FROST FREE

Yes
Frost Free adds $100
to the price

ENERGY USE

$8.15 each month
similar models use
$7.81 to $9.70 each month

INSULATION

Cut Fiber Glass-
standard

ICEMAKER

Yes
Icemaker adds $75
to the price

MODEL 4

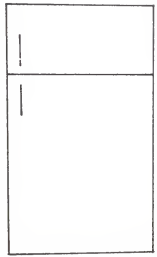
TOP FREEZER STYLE WITH FROST FREE DEFROST AND ICEMAKER

PRICE

$589.00

SIZE

20 cubic feet
15 fresh food
5 freezer



FROST FREE

Yes
Frost Free adds $100
to the price

ENERGY USE

$6.55 each month
similar models use
$6.25 to $11.34 each month

INSULATION

Cut Fiber Glass-
standard

ICEMAKER

Yes
Icemaker adds $75
to the price

APPENDIX G

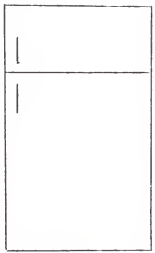
MODEL DISPLAYS FOR THE ANNUAL DOLLARS CONDITION

MODEL 1

TOP FREEZER STYLE WITH MANUAL DEFROST

PRICE

$359.00



SIZE

17 cubic feet
13 fresh food
4 freezer

FROST FREE

No

ENERGY USE

$32.40 each year

INSULATION

Poured insulation-
adds $20 to the price

ICEMAKER

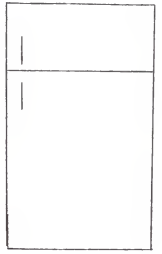
No

MODEL 2

TOP FREEZER STYLE WITH FROST FREE DEFROST

PRICE

$439.00



SIZE

17 cubic feet
13 fresh food
4 freezer

FROST FREE

Yes
Frost Free adds $100 to the price

ENERGY USE

$101.00 each year

INSULATION

Cut Fiber Glass - standard

ICEMAKER

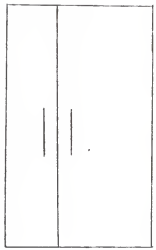
No

MODEL 3

SIDE BY SIDE STYLE WITH FROST FREE DEFROST AND ICEMAKER

PRICE

$669.00



SIZE

19 cubic feet
13 fresh food
6 freezer

FROST FREE

Yes
Frost Free adds $100
to the price

ENERGY USE

$96.80 each year

INSULATION

Cut Fiber Glass-
standard

ICEMAKER

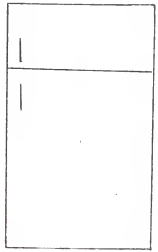
Yes
Icemaker adds $75
to the price

MODEL 4

TOP FREEZER STYLE WITH FROST FREE DEFROST AND ICEMAKER

PRICE

$589.00



SIZE

20 cubic feet
15 fresh food
5 freezer

FROST FREE

Yes
Frost Free adds $100
to the price

ENERGY USE

$76.80 each year

INSULATION

Cut Fiber Glass-
standard

ICEMAKER

Yes
Icemaker adds $75
to the price

APPENDIX H

HUMAN RELEASE FORM

APPENDIX H

HUMAN RELEASE FORM

In the following experiment you will be asked to evaluate different models of refrigerator-freezers based on information presented to you. Your responses are important, and from the task you may gain some knowledge of refrigerator-freezers.

Your participation is voluntary and may be discontinued should you desire.

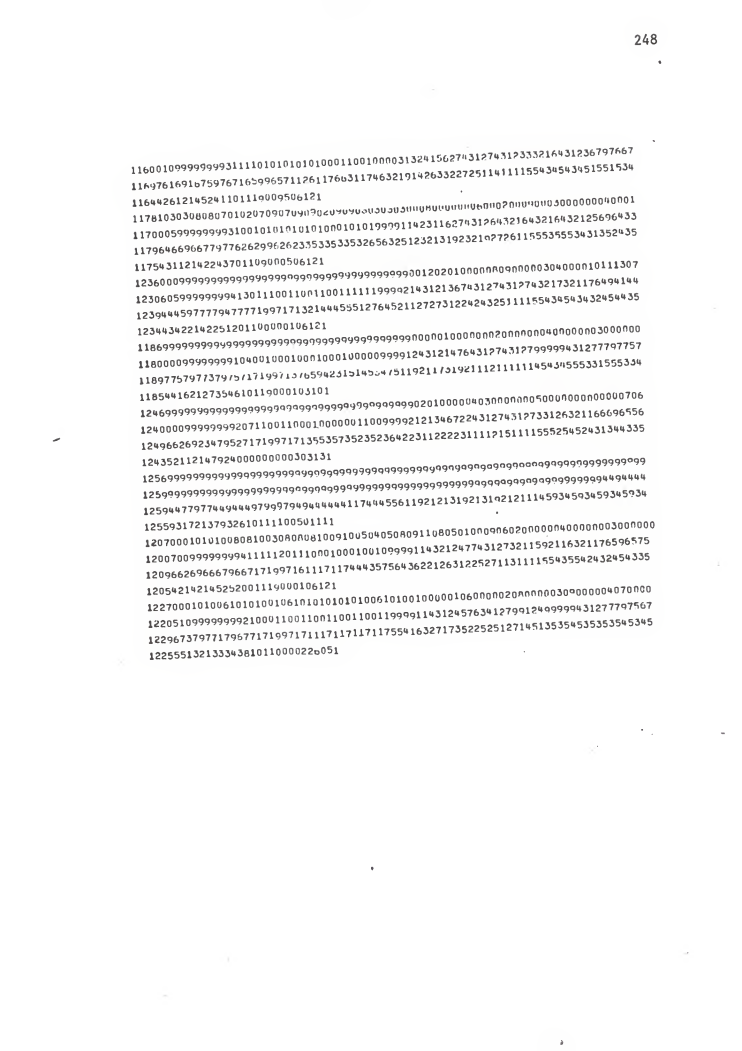
For your participation a contribution of $2 will be made to the organization of which you are a member.

"I have read and I understand the procedure described above. I agree to participate in the procedure and I have received a copy of this procedure."

Signed _____

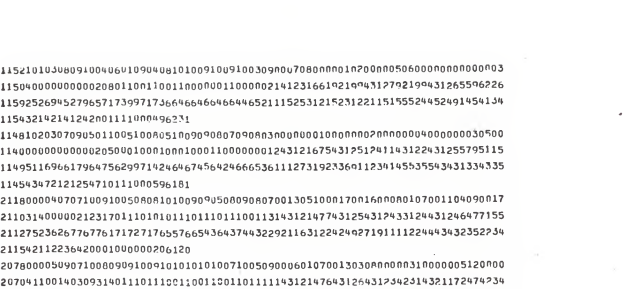
APPENDIX I

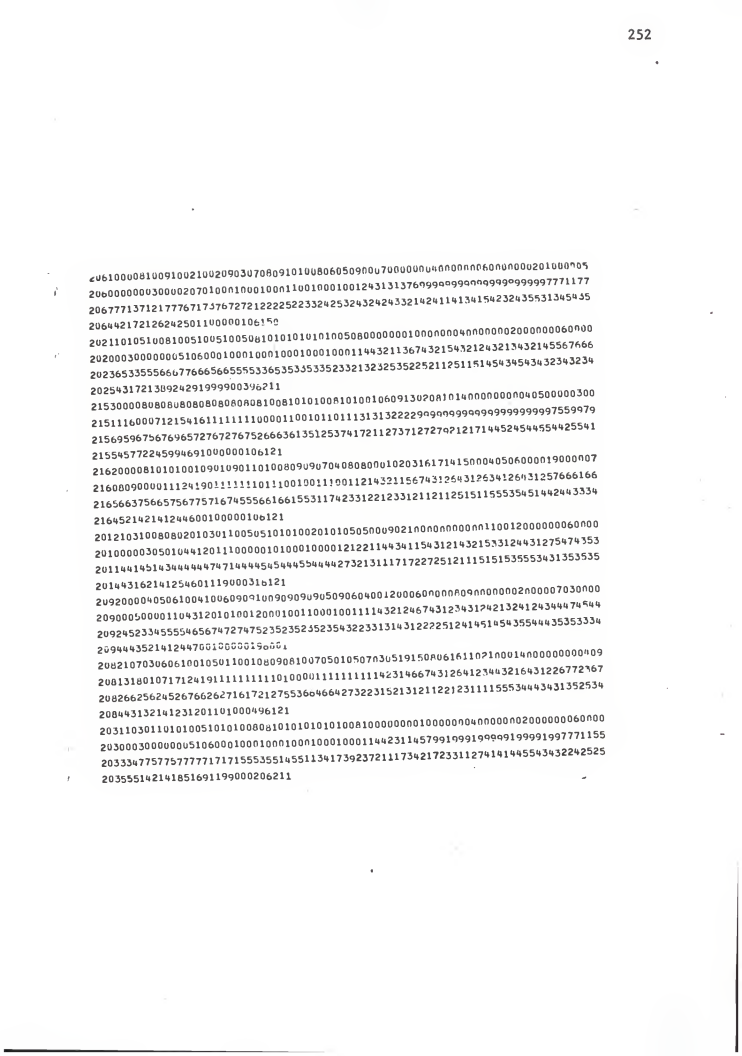
DATA

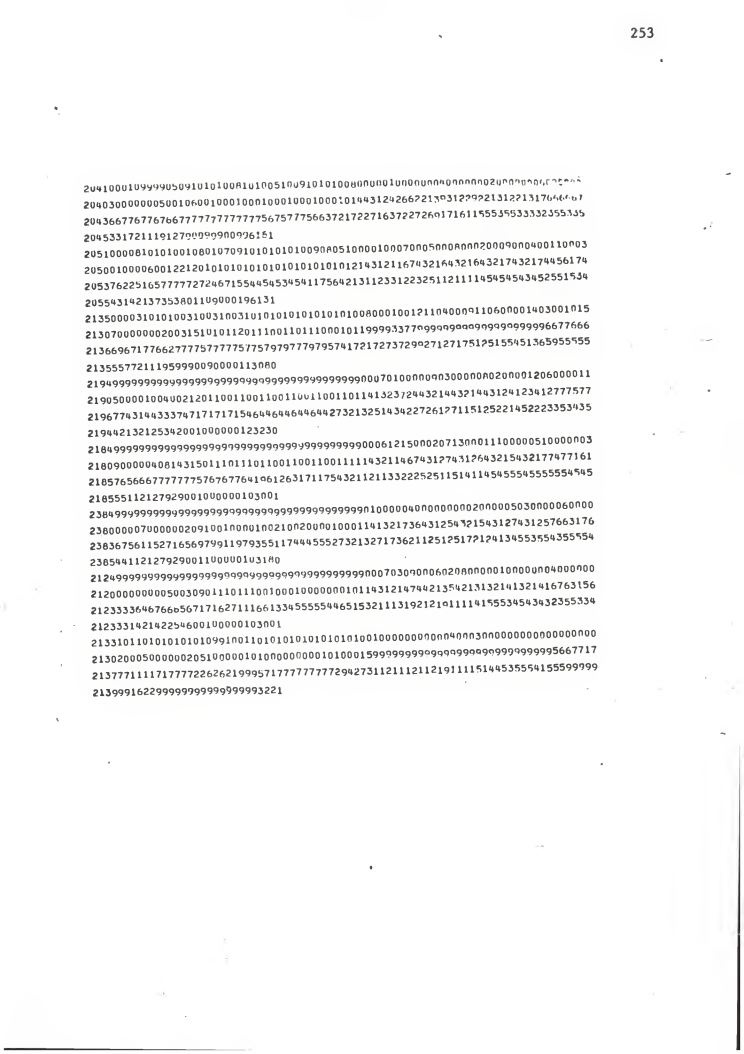


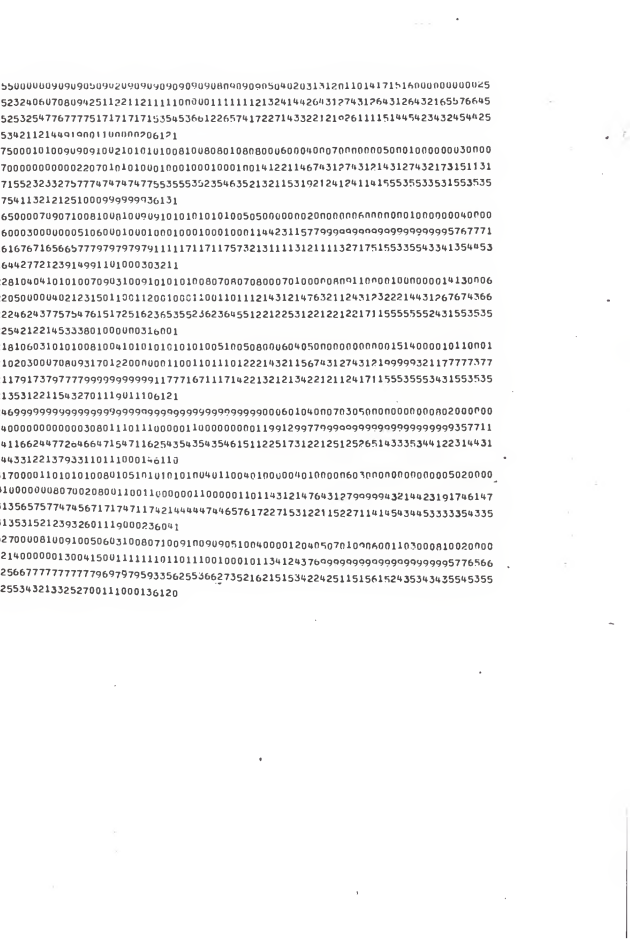
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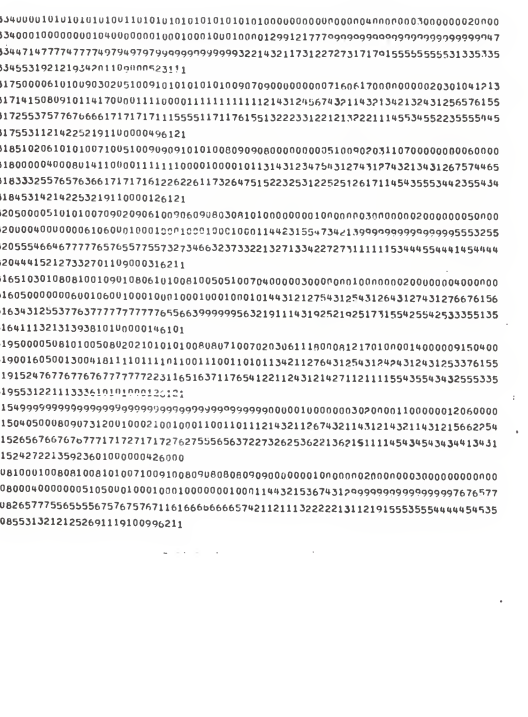
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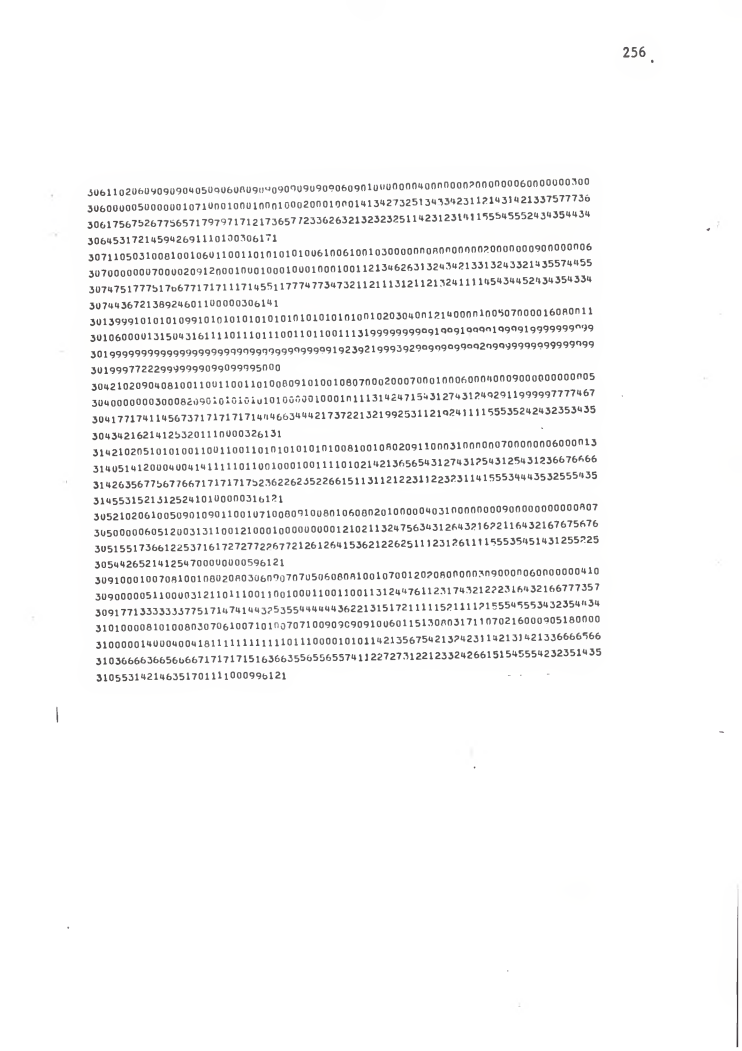


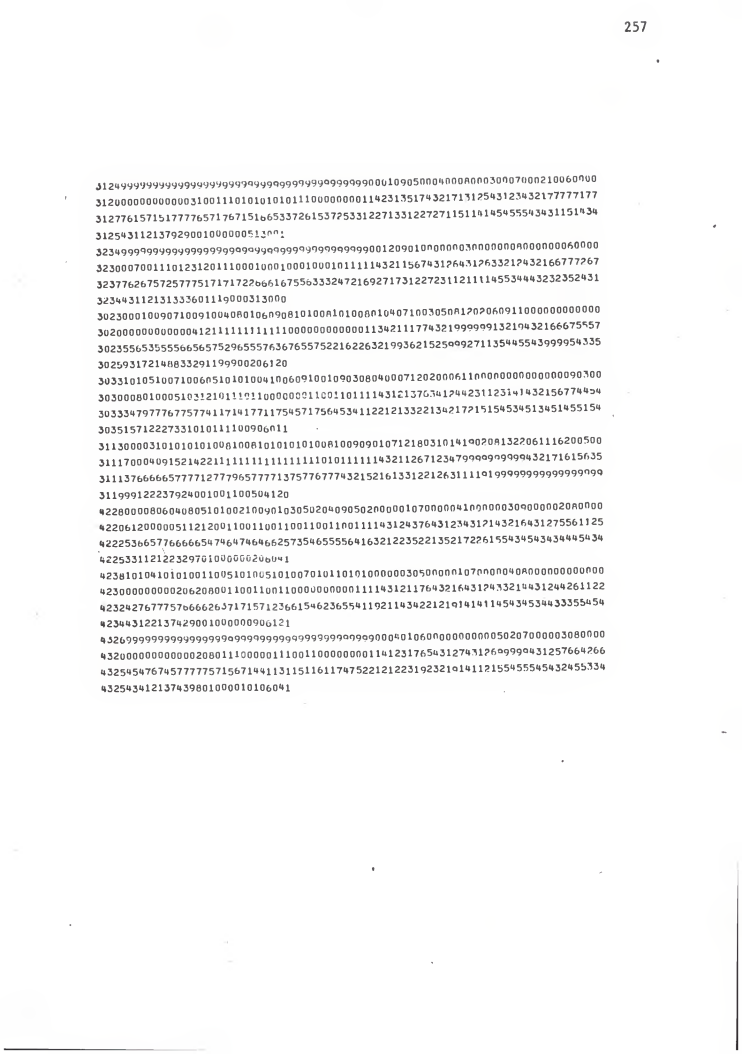












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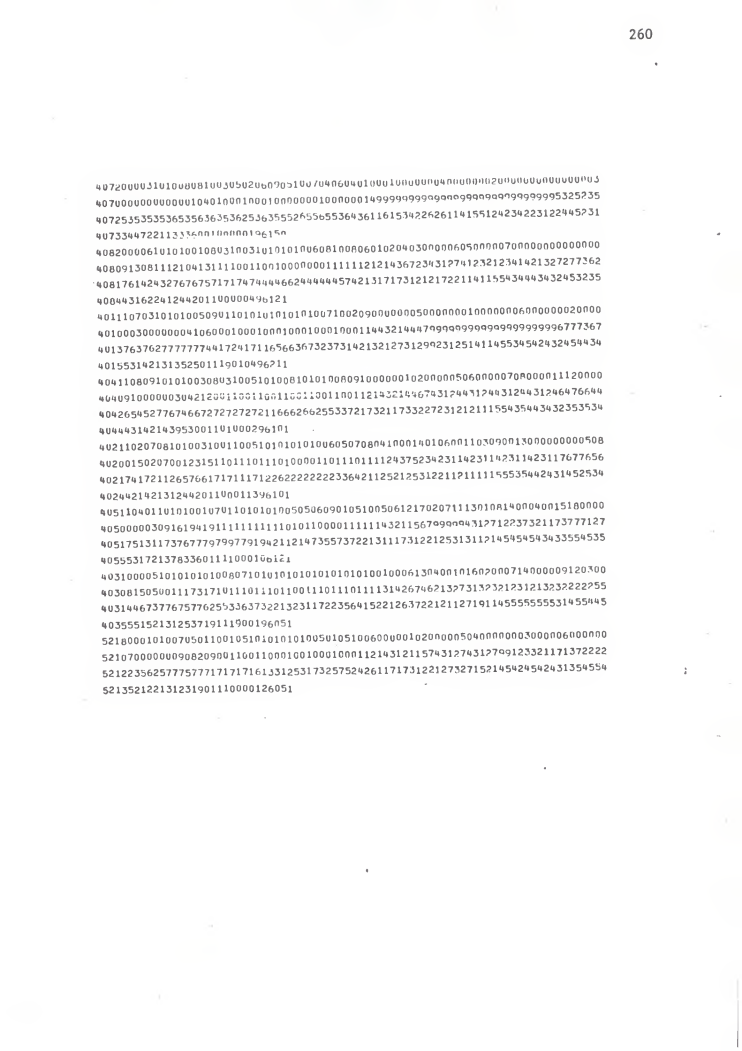
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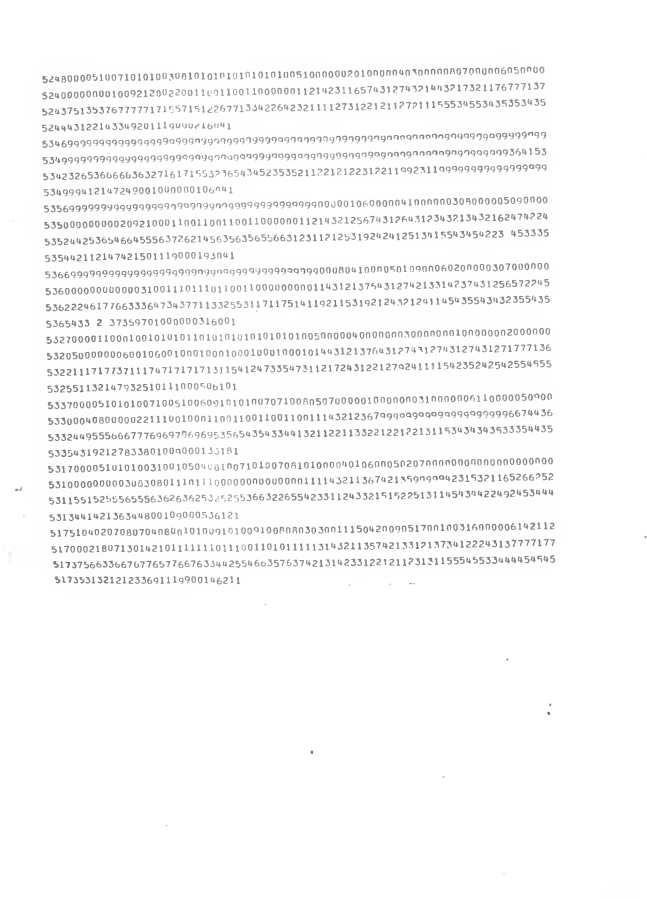
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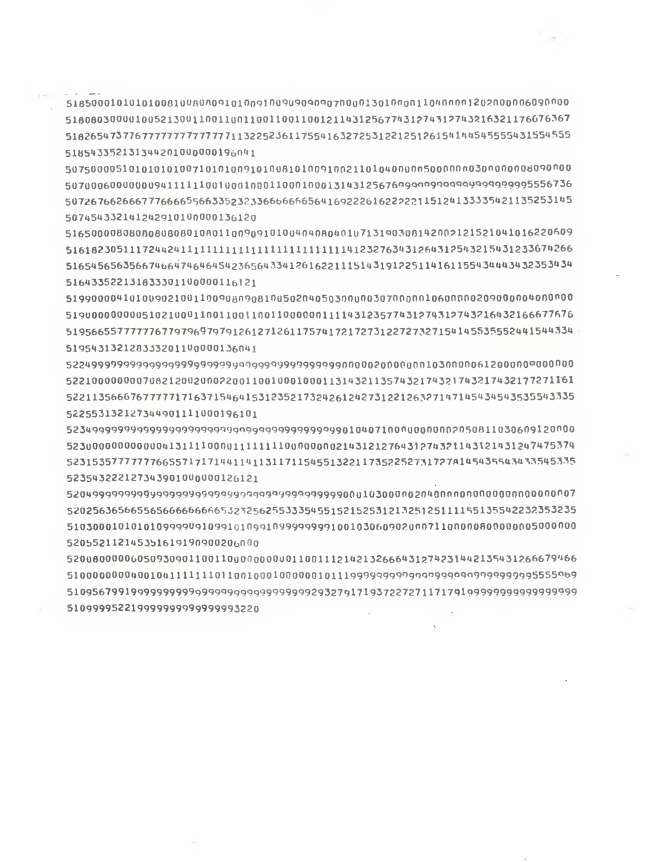
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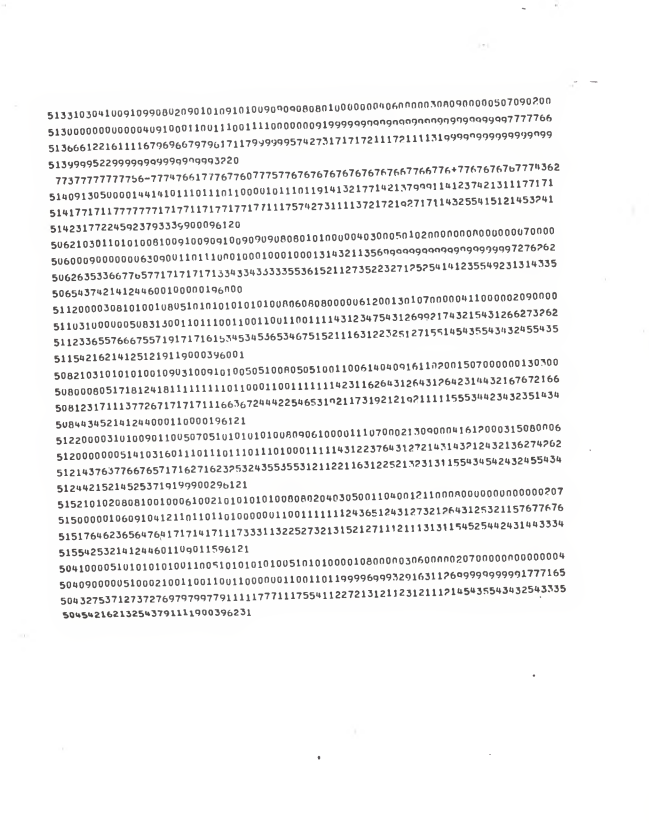
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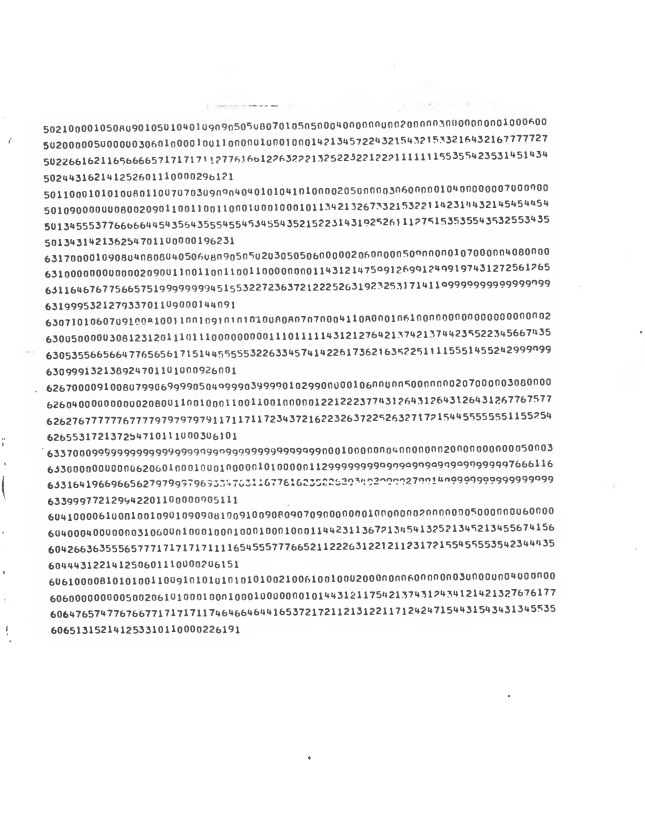












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APPENDIX J

CODEBOOK

APPENDIX J
CODEBOOK

COLUMN	VARIABLE	VARIABLE NAME	VALUES	CARD
1	TRTMNT	TREATMENT LEVEL	1-no energy; 2-$/yr+r+f; 3-$/yr+r; 4-KWH/yr+r; 5-$/mo+r; 6-$/yr	1
2-3	IDNMBR	RESPONDENT NUMBER		
4	GROUPX	EXPERIMENTAL GROUP		
5	UNAENU	IMPORTANCE OF ENERGY USE (UNAIDED)	0-no; 1-yes	
6-7	RNKENU	RANK OF UNAIDED ENERGY USE	ACTUAL VALUE	
8-9	IMPCLR	IMPORTANCE OF COLOR	1-not at all important to me 10-extremely important to me	
10-11	IMSZFR	IMPORTANCE OF SIZE FREEZER		
12-13	IMSZFF	IMPORTANCE OF SIZE FRESH FOOD		
14-15	IMPWAR	IMPORTANCE OF WARRANTY		
16-17	IMPCRD	IMPORTANCE OF CREDIT		
18-19	IMPRIC	IMPORTANCE OF PRICE		
20-21	IMPCWT	IMPORTANCE OF COLD WATER DISPENSER		
22-23	IMPENU	IMPORTANCE OF ENERGY USE		
24-25	IMPICE	IMPORTANCE OF ICEMAKER		
26-27	IMPDEF	IMPORTANCE OF TYPE OF DEFROST		
28-29	IMPQUE	IMPORTANCE OF QUALITY		
30-31	IMPSVC	IMPORTANCE OF SERVICE		
32-33	IMPEXP	IMPORTANCE OF EXPERIENCE		
34-35	IMPINS	IMPORTANCE OF INSULATION		
36-37	IMPSHL	IMPORTANCE OF SHELVE TYPE		
38-39	IMPMAG	IMPORTANCE OF MAINTENANCE AGREEMENT		
40-41	IMPAPP	IMPORTANCE OF APPEARANCE		
42-43	IMLOFR	IMPORTANCE OF LOCATION OF FREEZER		
44-45	AC1PRC	ACQUISITION ORDER PRICE 1	actual value 99-missing	
46-47	AC2PRC	ACQUISITION ORDER PRICE 2		
48-49	AC3PRC	ACQUISITION ORDER PRICE 3		
50-51	AC4PRC	ACQUISITION ORDER PRICE 4		

APPENDIX J (continued)

COLUMN	VARIABLE	VARIABLE NAME	VALUES	CARD
52-53	AC1SIZ	ACQUISITION ORDER SIZE 1		
54-55	AC2SIZ	ACQUISITION ORDER SIZE 2		
56-57	AC3SIZ	ACQUISITION ORDER SIZE 3		
58-59	AC4SIZ	ACQUISITION ORDER SIZE 4		
60-61	AC1FFR	ACQUISITION ORDER FFREE 1		
62-63	AC2FFR	ACQUISITION ORDER FFREE 2		
64-65	AC3FFR	ACQUISITION ORDER FFREE 3		
66-67	AC4FFR	ACQUISITION ORDER FFREE 4		
68-69	AC1IMK	ACQUISITION ORDER ICEMKR 1	actual value 99-missing	
70-71	AC2IMK	ACQUISITION ORDER ICEMKR 2		
72-73	AC3IMK	ACQUISITION ORDER ICEMKR 3		
74-75	AC4IMK	ACQUISITION ORDER ICEMKR 4		
76-77	AC1INS	ACQUISITION ORDER INSULA 1		
78-79	AC2INS	ACQUISITION ORDER INSULA 2		
1-3	TRTIXX	TREATMENT ID		
4-5	AC3INS	ACQUISITION ORDER INSULA 3		
6-7	AC4INS	ACQUISITION ORDER INSULA 4		2
8-9	ACLENU	ACQUISITION ORDER ENERGY 1		
10-11	AC2ENU	ACQUISITION ORDER ENERGY 2	actual value	
12-13	AC3ENU	ACQUISITION ORDER ENERGY 3		
14-15	AC4ENU	ACQUISITION ORDER ENERGY 4		
16	NUMMOD	NUMBER OF MODELS EXAMINED		
17-18	NUMDIM	NUMBER OF DIMENSIONS ACQUIRED		
19	FR1PRC	FREQUENCY OF MODEL 1 PRICE		
20	FR2PRC	FREQUENCY OF MODEL 2 PRICE		
21	FR3PRC	FREQUENCY OF MODEL 3 PRICE		
22	FR4PRC	FREQUENCY OF MODEL 4 PRICE		
23	FR1SIZ	FREQUENCY OF MODEL 1 SIZE		
24	FR2SIZ	FREQUENCY OF MODEL 2 SIZE		
25	FR3SIZ	FREQUENCY OF MODEL 3 SIZE		
26	FR4SIZ	FREQUENCY OF MODEL 4 SIZE		

COLUMN	VARIABLE	VARIABLE NAME	VALUES	CARD
27	FR1FFR	FREQUENCY OF MODEL 1 FFREE		
28	FR2FFR	FREQUENCY OF MODEL 2 FFREE		
29	FR3FFR	FREQUENCY OF MODEL 3 FFREE		
30	FR4FFR	FREQUENCY OF MODEL 4 FFREE		
31	FR1IMK	FREQUENCY OF MODEL 1 ICEMKR		
32	FR2IMK	FREQUENCY OF MODEL 2 ICEMKR		
33	FR3IMK	FREQUENCY OF MODEL 3 ICEMKR		
34	FR4IMK	FREQUENCY OF MODEL 4 ICEMKR		
35	FR1INS	FREQUENCY OF MODEL 1 INSULATION		
36	FR2INS	FREQUENCY OF MODEL 2 INSULATION		
37	FR3INS	FREQUENCY OF MODEL 3 INSULATION		
38	FR4INS	FREQUENCY OF MODEL 4 INSULATION		
39	FR1ENU	FREQUENCY OF MODEL 1 ENERGY		
40	FR2ENU	FREQUENCY OF MODEL 2 ENERGY		
41	FR3ENU	FREQUENCY OF MODEL 3 ENERGY		
42	FR4ENU	FREQUENCY OF MODEL 4 ENERGY		
43	STRTGY	ACQUISITION STRATEGY	1-by model; 2-by dimension; 3-mixed; 4-unclassified	
44	UNDRST	UNDERSTOOD TASK	1-yes; 2-didn't shop for models; 3-had preference before task; 4-did not understand task	
45	PREFM1	RANK PREFERENCE MODEL 1	1-most prefer; 4-least prefer; 9-missing	
46	PREFM2	RANK PREFERENCE MODEL 2		
47	PREFM3	RANK PREFERENCE MODEL 3		
48	PREFM4	RANK PREFERENCE MODEL 4		
49	IMPRM1	OVERALL IMPRESSION MODEL 1	1-very unfavorable; 7-very favorable; 9-missing	
50	IMPRM2	OVERALL IMPRESSION MODEL 2		
51	IMPRM3	OVERALL IMPRESSION MODEL 3		
52	IMPRM4	OVERALL IMPRESSION MODEL 4		

APPENDIX J (continued)

COLUMN	VARIABLE	VARIABLE NAME	VALUES	CARD
53	RNK1PP	RANK MODEL 1 PRICE	1-highest price; 4-lowest price; 9-missing	
54	RNK2PP	RANK MODEL 2 PRICE		
55	RNK3PP	RANK MODEL 3 PRICE		
56	RNK4PP	RANK MODEL 4 PRICE		
57	DFFRPP	DIFFICULTY TO RANK PRICE	1-difficult; 7-easy; 9-missing	
58	RNK1EU	RANK MODEL 1 ENERGY	1-most energy; 4-least energy; 9-missing	
59	RNK2EU	RANK MODEL 2 ENERGY		
60	RNK3EU	RANK MODEL 3 ENERGY		
61	RNK4EU	RANK MODEL 4 ENERGY		
62	DFFREU	DIFFICULTY TO RANK ENERGY	1-difficult; 7-easy; 9-missing	
63	RNK1SZ	RANK MODEL 1 SIZE	1-largest; 4-smallest; 9-missing	
64	RNK2SZ	RANK MODEL 2 SIZE		
65	RNK3SZ	RANK MODEL 3 SIZE		
66	RNK4SZ	RANK MODEL 4 SIZE		
67	DFFRSZ	DIFFICULTY TO RANK SIZE	1-difficult; 7-easy; 9-missing	
68	RNK1FE	RANK MODEL 1 FEATURES	1-most; 4-least; 9-missing	
69	RNK2FE	RANK MODEL 2 FEATURES		
70	RNK3FE	RANK MODEL 3 FEATURES		
71	RNK4FE	RANK MODEL 4 FEATURES		
72	DFFFEA	DIFFICULTY TO RANK FEATURES	1-difficult; 7-easy; 9-missing	
73	MD1PRC	OPINION MODEL 1 PRICE	1-bad; 7-good; 9-missing	3
74	MD1SIZ	OPINION MODEL 1 SIZE		
75	MD1ENU	OPINION MODEL 1 ENERGY USE		
76	MD1STY	OPINION MODEL 1 STYLE		
77	MD1FEA	OPINION MODEL 1 FEATURES		
78	MD2PRC	OPINION MODEL 2 PRICE		
79	MD2SIZ	OPINION MODEL 2 SIZE		
1-3	TRTIDE	TREATMENT/ID		
4	MD2ENU	OPINION MODEL 2 ENERGY USE		
5	MD2STY	OPINION MODEL 2 STYLE		
6	MD2FEA	OPINION MODEL 2 FEATURES		

COLUMN	VARIABLE	VARIABLE NAME	VALUES	CARD
7	MD3PRC	OPINION MODEL 3 PRICE		
8	MD3SIZ	OPINION MODEL 3 SIZE		
9	MD3ENU	OPINION MODEL 3 ENERGY USE		
10	MD3STY	OPINION MODEL 3 STYLE		
11	MD3FEA	OPINION MODEL 3 FEATURES		
12	MD4PRC	OPINION MODEL 4 PRICE		
13	MD4SIZ	OPINION MODEL 4 SIZE		
14	MD4ENU	OPINION MODEL 4 ENERGY USE		
15	MD4STY	OPINION MODEL 4 STYLE		
16	MD4FEA	OPINION MODEL 4 FEATURES		
17	EVSZUS	EVALUATION USEFUL SIZE		
18	EVSZCM	EVALUATION COMPLEX SIZE		
19	EVFFUS	EVALUATION USEFUL FFREE		
20	EVFFCM	EVALUATION COMPLEX FFREE		
21	EVEUUS	EVALUATION USEFUL ENERGY	1-useless; 7-useful; 9-missing	
22	EVEUCM	EVALUATION COMPLEX ENERGY	1-simple; 7-complex; 9-missing	
23	EVIMUS	EVALUATION USEFUL ICEMAKER		
24	EVIMCM	EVALUATION COMPLEX ICEMAKER		
25	EVINUS	EVALUATION USEFUL INSULATION		
26	EVINCM	EVALUATION COMPLEX INSULATION		
27	MD1BVA	BETTER VALUE MODEL 1		
28	MD1EFF	WORTH EFFORT MODEL 1		
29	MD1ENC	ENCOURAGE MODEL 1		
30	MD2BVA	BETTER VALUE MODEL 2	1-very unlikely; 7-very likely; 1-not worth; 7-clearly worth; 1-discourage; 7-encourage; 9-missing	
31	MD2EFF	WORTH EFFORT MODEL 2		
32	MD2ENC	ENCOURAGE MODEL 2		
33	MD3BVA	BETTER VALUE MODEL 3		
34	MD3EFF	WORTH EFFORT MODEL 3		
35	MD3ENC	ENCOURAGE MODEL 3		
36	MD4BVA	BETTER VALUE MODEL 4		
37	MD4EFF	WORTH EFFORT MODEL 4		
38	MD4ENC	ENCOURAGE MODEL 4		

COLUMN	VARIABLE	VARIABLE NAME	VALUES	CARD
39	SIZEXX	SIZE	1-16; 2-17; 3-18; 4-19; 5-20; 6-20+	3
40	LIKSIZ	LIKELIHOOD DIFFERENT SIZE	1-unlikely; 7-likely; 9-missing	
41	SECSIZ	SECOND CHOICE SIZE	same as Column 39	
42	STYLEX	STYLE	1-s/s; 2-top freezer; 3-bottom; 9-missing	
43	LIKSTY	LIKELIHOOD DIFFERENT STYLE	same as Column 40	
44	SECSTY	SECOND CHOICE STYLE	same as Column 42	
45	COLORX	COLOR	1-white; 2-color; 9-missing	
46	LIKCOL	LIKELIHOOD DIFFERENT COLOR	same as Column 40	
47	INSULA	INSULATION	1-cut fiber; 2-poured; 9-missing	
48	LIKINS	LIKELIHOOD DIFFERENT INSULATION	same as Column 40	
49	DEFROS	DEFROST	1-manual; 2-partial; 3-ffree; 9-missing	
50	LIKDEF	LIKELIHOOD DIFFERENT DEFROST	same as Column 40	
51	SECDEF	SECOND CHOICE DEFROST	same as Column 49	
52	ICEMAK	ICEMAKER	1-no; 2-yes; 9-missing	
53	LIKICE	LIKELIHOOD DIFFERENT ICEMAKER	same as Column 40	
54	SHELVE	SHELVE	1-statwire; 2-adj.glass; 3-statewire	
55	LIKSHE	LIKELIHOOD DIFFERENT SHELVE	same as Column 40	
56	SECSHE	SECOND CHOICE SHELVE	same as Column 54	
57	POWMIZ	POWER MIZER	1-no; 2-yes; 9-missing	
58	LIKPOW	LIKELIHOOD DIFFERENT POWER MIZER	same as Column 40	
59	COLDWT	COLD WATER DISPENSER	1-no; 2-yes; 9-missing	
60	LIKCLD	LIKELIHOOD DIFFERENT COLD WATER DIS.	same as Column 40	
61	UNDERS	UNDERSTAND RECOMMENDATION	1-yes; 2-inconsistent within model; 3-incomplete; 4-did not use information; 5-did not want to give advice; 6-used b.v. scale inconsistently; 7-used eff. scale inconsistently; 8-used enc. scale inconsistently; 9-did not understand	
62	UNDERB	UNDERSTOOD BUILDING	1-yes; 2-incomplete; 3-no	
63	FRFRPP	FROST FREE PRICE		
64	FRFRCO	FROST FREE CONVENIENCE	1-strongly decreases; 2-slightly decreases;	

COLUMN	VARIABLE	VARIABLE NAME	VALUES	CARD
65	FRFREU	FROST FREE ENERGY USE	3-does not effect; 4-slight	
66	FRFRRE	FROST FREE RELIABILITY	increases; 5-strongly increases	
67	ICEMPP	ICEMAKER PRICE		
68	ICEMCO	ICEMAKER CONVENIENCE		
69	ICEMEU	ICEMAKER ENERGY USE		
70	ICEMRE	ICEMAKER RELIABILITY		
71	POINCO	POURED INSULATION PRICE		
72	POINCO	POURED INSULATION CONVENIENCE		
73	POINEU	POURED INSULATION ENERGY USE		
74	POINRE	POURED INSULATION RELIABILITY		
75	SSIDPP	SIDE BY SIDE PRICE		
76	SSIDCO	SIDE BY SIDE CONVENIENCE		
77	SSIDEU	SIDE BY SIDE ENERGY USE		
78	SSIDRE	SIDE BY SIDE RELIABILITY		
79	CLWAPP	COLD WATER DISPENSER PRICE		
1-3	TRTIXX	TREATMENT/ID		4
4	CLWACO	COLD WATER DISPENSER CONVENIENCE		
5	CLWAEU	COLD WATER DISPENSER ENERGY USE		
6	CLWARE	COLD WATER DISPENSER RELIABILITY		
7	LIKBUY	LIKELIHOOD BUY THIS YEAR		
8	AGEXXX	AGE	1-20,25; 2-26,30; 3-36,40; 4-41,45; 6-46,50; 7-50+	
9	SEXXXX	SEX	1-male; 2-female	
10	RACEXX	RACE	1-white; 2-black; 3-other	
11	EDUCAT	EDUCATION	1-some high school; 2-high school; 3- some college; 4-college;	
12	OCCUPA	OCCUPATION	1-housewife; 2-mgt-prof; 3-sales; 4-student;	
13	SOCCUP	SPOUSE OCCUPATION	5-educator; 6-nurse; 7-secretary; 8-other; 9-missing	
14	INCOME	INCOME	1=5,1-5-10; 2=10-15; 3=15,20; 4=20+	
15	LSTPUR	LAST PURCHASE REFRIGERATOR	0=never; 1=1; 2=1-3; 3=4-6; 5=7+	
16	MAKERE	MAKE OF OWN REFRIGERATOR		
17	SIDSI	SIDE BY SIDE ON OWN		
18	TOPFRE	TOP FREEZER	1-yes; 2-no	

COLUMN	VARIABLE	VARIABLE NAME	VALUES	CARD
19	ICEMKR	ICEMAKER		
20	PORINS	POURED INSULATION		
21	COLDWA	COLD WATER DISPENSER ON OWN		
22	KWHRAT	KNOW KWH RATE		
23	ACCKWH	ACCURACY OF KWH RATE		
24	CHOICE	CHOICE OF DISCLOSURE	1-$/mo; 2-$/yr; 3-KWH/mo; 4-KWH/yr; 5-1&3; 6=2&4	
25	CHILDR	# OF CHILDREN	actual value	
26	COMPLE	DEGREE OF COMPLETION	1-did not do I; 2-did not do II; 3-incomplete I; 4-incomplete II; 5-did not do I & II; 6-complete	
27				
28-29	TASKXX	TASK COMPLETION	0-did not access 1 and guessed; 1-3, 2 through 4 and guessed; 4-1&2; 10-ranked all the same; 11-did not do task; 12-complete 13-3&1; 14-3&4; 15-1,3&4; 16-1,2&4; 17-2,3&4; 18-2&3; 19-2&4; 20-1&2; 21-1,2&3; 22-did not do recall; 23-1&4	
30	MATCHI	UNDERSTOOD MATCHING	1-yes; 0-no	

APPENDIX K

COMPUTER RUNS BY HYPOTHESIS

APPENDIX K
COMPUTER RUNS BY HYPOTHESIS

I. Computer runs for Hypothesis One

```
RECODE          TRTMNT (2 THRU HIGHEST = 2)
RECODE          RNK1EU (4=1)(1,2,3=0)
RECODE          RNK2EU (1=1)(2,3,4=0)
RECODE          RNK3EU (2=1)(1,3,4=0)
RECODE          RNK4EU (3=0)(1,2,4=0)
RECODE          PREFM2 (1=1)(2 THRU HIGHEST=0)
COMPUTE         NUMBER = RKN1EU + RKN2EU + RNK3EU + RKN4EU
CROSSTABS       TABLES = RKN1EU TO RKN4EU, PREFM2, NUMBER BY
                  TRTMNT

ONEWAY          IMPRM1 TO IMPRM4 BY TRTMNT (1,6)/
                RANGES = TUKEYB/
```

II. Computer runs for Hypothesis Two

```
RECODE          TRTMTN (6=1)(3,4,5=2)
ONEWAY          MD2BVA TO MD4EFF BY TRTMNT (1,2/
                RANGES=TUKEYB/
```

III. Computer runs for Hypothesis Three

```
T-TEST          PAIRS=MD2ENU WITH MD1ENU/MD2ENU WITH
                MD3ENU/MD2ENU WITH MD4ENU/
```

IV. Computer runs for Hypothesis Four

```
RECODE          TRTMNT (3,4,5,6=2)
ONEWAY          SIZEXX BY TRTMNT (1,2)/
*RECODE         STYLEX(3=2)
*RECODE         DEFROS(2=1)(3=2)
CROSSTABS       TABLES=STYLEX,DEFROS,INSULA,ICEMAK POWMIO BY
                  TRTMNT

*RECODE         STYLEX(1=10.00)(2,3=0)
*RECODE         INSULA(1=7.50)(2=0)
*RECODE         SIZEXX(1=32.4)(2=36.4)(3=40.4)(4=44.4)
                      (5=48.4)(6=52.4)
*RECODE         DEFROS (1,2=0)(3=25.00)
*RECODE         ICEMAK(1=7.5)(2=0)
*RECODE         POWMIO(1=7.5)(2=0)
```

APPENDIX K (continued)

```
*COMPUTE          ENERGY=STYLEX + SIZEXX + INSULA + SICEXX +
                  DEFROS + ICEMAK + POWMIO
ONEWAY            ENERGY BY TRTMNT (1,2)/

*RECODE           STYLEX(1=90)(2=0)(3=40)
*RECODE           SIZEXX (=315)(2=340)(3=365)(4=390)(5=415)(6=440)
*RECODE           DEFROS (1=0)(2=30)(3=100)
*RECODE           ICEMAK(1=0)(2=75)
*RECODE           COLORX(1=0)(2=10)
*RECODE           SHELVE(1=0)(2=20)(3=30)
*RECODE           POWMIO(1=0)(2=60)
*RECODE           CLDWAT(1=0)(2=75)
*COMPUTE          PRICE=STYLEX + SIZEXX + INSULA + DEFROS +
                  COLORX + SHELVE + POWMIO + CLD WAT
ONEWAY            PRICE BY TRTMNT(1,2)/
```

V. Computer runs for Hypothesis Five

```
RUN SUBFILES      (A,B)
RUN SUBFILES      (A,C)
RUN SUBFILES      (A,D)
RUN SUBFILES      (A,E)
RUN SUBFILES      (A,F)
RUN SUBFILES      (C,B)
RUN SUBFILES      (C,D)
RUN SUBFILES      (C,E)
CROSSTABS         TABLES=RNK1EU TO RKN4EU, PREFM2, STYLEX,
                  POWMIO, DEFROS, INSULA BY TRTMNT
```

same recode cards as in Hypothesis Four

```
ONEWAY            SIZEXX,EVEUFF EVEUPI, EVEUCW, EVEUSS, ENERGY,
                  PRICE BY TRTMNT(1,6)/
```

VI. Computer runs for Hypothesis Six

```
CROSSTABS         AGEXX, EDUCAT, OCCUPA, SOCCUP, CHILDR BY
                  STYLEX, DEFROS, INSULA, PREFM2, RNK2EU,
                  FR1ENU TO FR4ENU
```

BIOGRAPHICAL SKETCH

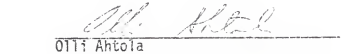
Dennis L. McNeill was born in Kokomo, Indiana, on April 3, 1947. He received his elementary education at West Nichols Hills Elementary School in Oklahoma City, Oklahoma. His secondary education was completed at John Marshall High School in the Oklahoma City Public School System. In 1966 he entered Oklahoma State University, and was awarded a Bachelor of Science in Economics in May, 1969. In September, 1969, he entered the Master of Business Administration program at Oklahoma State University graduating in December, 1970. From January, 1971 to May, 1973, he served in a number of management positions with Southwestern Bell Telephone Company in Oklahoma. In May, 1973 he entered the Graduate School at the University of Florida. His Doctor of Philosophy Degree in Marketing was completed in May, 1977.

I certify that I have read this study and that in my opinion it conforms to acceptable standards of scholarly presentation and is fully adequate, in scope and quality, as a dissertation for the degree of Doctor of Philosophy.



William L. Wilkie, Chairman
Associate Professor of Marketing

I certify that I have read this study and that in my opinion it conforms to acceptable standards of scholarly presentation and is fully adequate, in scope and quality, as a dissertation for the degree of Doctor of Philosophy.



Olli Ahtola
Assistant Professor of Marketing

I certify that I have read this study and that in my opinion it conforms to acceptable standards of scholarly presentation and is fully adequate, in scope and quality, as a dissertation for the degree of Doctor of Philosophy.



Barry R. Schlenker
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This dissertation was submitted to the Graduate Faculty of the Department of Marketing in the College of Business Administration and to the Graduate Council, and was accepted as partial fulfillment of the requirements for the degree of Doctor of Philosophy.

Dean, Graduate School

June, 1977